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# REPORT OF CHIEF OF BUREAU OF AGRICULTURAL ECONOMICS

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UNITED STATES DEPARTMENT OF AGRICULTURE,  
BUREAU OF AGRICULTURAL ECONOMICS,  
*Washington, D. C., September 25, 1924.*

SIR: I have the honor to transmit herewith a report of the work of the Bureau of Agricultural Economics for the fiscal year ended June 30, 1924.

Respectfully,

HENRY C. TAYLOR,  
*Chief of Bureau.*

Hon. HENRY C. WALLACE,  
*Secretary of Agriculture.*

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The second year of operation of the Bureau of Agricultural Economics was completed June 30, 1924. This bureau, which was formed by the consolidation of the Bureau of Markets and Crop Estimates and the Office of Farm Management and Farm Economics, is proving to be a most effective organization in dealing with the economic problems of agriculture. While the work has been broadened in many lines, the principal improvement has been in the adoption of more intensified methods of study and the redirection of the forces of the bureau toward the economic problems of greatest current importance. The coordination of workers in the closely related fields of crop estimating, marketing, and farm management has made it possible for the bureau to render a service of greater practical value to farmers and at the same time to secure greater economy in administration.

## ECONOMIC INFORMATION DEMANDED

The demands upon the bureau for assistance and information have been particularly heavy during the past year due largely to the unsatisfactory and rapidly changing agricultural conditions. The bureau has met this demand as fully as possible by bringing its forces to the study of specific problems and at the same time continuing the general services and re-

search on fundamental problems. It has been our purpose to apply available knowledge to readjustment problems, to aid farmers in meeting the changed conditions, and to anticipate further changes where possible. The rapidly changing agricultural situation has made it necessary that the significant factors influencing supply, demand, and prices of farm products be measured constantly. It has been our purpose to bring together these facts to serve as a sort of barometer of the agricultural industry. Several forms of new work designed to aid in accomplishing this purpose were inaugurated.

## OUTLOOK REPORT EXTENDED

The agricultural outlook reports inaugurated last year have been well received by agricultural workers and farmers and utilized as a basis for planning farm operations. The preparation of these reports which look into the future is now a thoroughly established part of the work of this bureau. These reports represent the best thought of our technical workers, tempered by close contact with the practical problems of production and marketing. The surveys of the intentions of farmers regarding planting plans and livestock-breeding operations have been more widely appre-

ciated and indorsed as their purpose has become better understood.

Close study has been given to world-wide agricultural conditions in connection with domestic problems in anticipating probable trends of production and market prices; research work has been arranged to supply the basic facts and develop methods of forecasting trends wherever possible; well-trained men have been added to the staff of the bureau for such work, and the personnel has been strengthened by redistribution of duties to make the best possible use of the training and skill of each worker.

The relation of agriculture to other industries has been given particular attention. Close study of the income of agriculture as an industry and of individual farmers has been made for the purpose of determining what may be expected as a reasonable return and to discover what conditions may be adjusted. The studies of cost of production, cost of marketing, the returns of agriculture, and farm income have all contributed to an understanding of this subject.

From studies made in this bureau it has been found that the rate of return on the farmers' capital investment has increased from the figure—3.1 per cent for the crop year 1920-21 to 1.4 per cent for the crop year 1923-24. It must be noted also that during these four years farmers experienced a deflation of property value by which the worth of capital investments owned by farm operators dropped from \$48,500,000,000 to \$33,422,000,000. While some improvement is noted, it is obvious that the income from agricultural production since the depression, which commenced with the price decline in 1920, has not been sufficient to allow both a commercial interest return on the capital used in the farming industry and an adequate wage for the labor of the farmer and his family.

This bureau is therefore giving intensive study to the problems involved in securing for agriculture its proportionate reward. The bureau endeavors to show the relation of more efficient farming and marketing to the problem of securing a fair share of the national income, as a basis of an adequate standard of living on farms and in rural communities. The publication of the facts as disclosed by careful statistical studies covering many localities, and at the same time making recommendations for changes wherever it appears that a

change will be beneficial, is helping farmers to eliminate present losses and to inaugurate programs of production which will yield them a better return for their labor and capital.

### FARM MANAGEMENT AND COST

At the close of the fiscal year the farm management and cost of production work of the bureau were consolidated. This step brings into still closer coordination the work which aims to assist farmers in modifying their programs of production in order to secure a greater return. Recommendations will be made for crop and livestock adjustment, based upon the close study of farm organization and cost, which will help to reduce the losses that result from misdirected effort.

Profitable systems of various types of farming, the lessons which come from the close study of costs, and the changes necessitated by shifting market demand will be considered more closely in order to secure practical results. An effort will be made to anticipate changes in types of farming in order to warn farmers against practices which may lead to loss.

### FOREIGN COMPETITION AND DEMAND

Much progress has been made in the establishment of a world crop and market reporting service, and valuable information with regard to world conditions is being made public. Many problems arise, however, in connection with the marketing of American agricultural products abroad which need the attention of men specially trained in agriculture and who have intimate knowledge of American production and of the interpretation of American standards for farm products. To meet this need the bureau has sent to the foreign field a number of highly trained men who will maintain contacts with agencies purchasing American products, and will handle problems arising in connection with the marketing of American farm products. These men will also furnish first-hand information with regard to trends of production in foreign countries and interpretations and analyses of all the factors affecting the demand for American farm products.

Both domestic and foreign markets are being studied to discover probable future requirements as well as immediate needs. Surveys of the market-

ing of leading commodities are being prepared in a series of commodity bulletins which present the economics of production as well as a description of the present channels and methods of distribution. Reviews of price changes and the market for products of various kinds and qualities accompany these surveys.

### CROP ESTIMATING

Marked advances in the development of crop and livestock forecasting and estimating have been made during the year. Not only has the scope of the work been widened, but the statistical methods used have been improved. New and better methods of estimating acreage have been devised, the price reporting work has been enlarged and strengthened, the semiannual pig surveys made through rural mail carriers have been expanded to include dairy cows and poultry, the "intention to plant" surveys have been further developed and have become a regular part of the work of the bureau, and the statistical technique of the forecasting and estimating work has been improved. The inauguration of extension work in statistics has been an important new factor that will greatly widen the field of usefulness of agricultural statistics. The forecasts and "intentions to plant" surveys furnish a timely basis for the readjustment of the farm program.

### MARKET NEWS SERVICE

There has been a steady and consistent demand throughout the country for more complete and timely information, and during the present year it has been possible to meet this demand in a measure by a substantial expansion of the market news service of the bureau. Congress increased the appropriation for the market news service for 1924 by \$300,000 over the appropriation for the preceding year, notwithstanding the fact that a vigorous policy of retrenchment in national expenditures has been adopted. This increase made it possible to extend the leased-wire system of the bureau to Florida and to the Pacific coast, thus reaching areas of heavy production of perishable products. Steady improvement has been made in the methods of furnishing the type of information needed in the various sections and very wide dissemination of information is being effected through the use of the radio broadcasting stations. As a result, the grower has secured a better distribution, espe-

cially of his perishable products, than ever before, and the fluctuation of prices generally has been relatively the same in both large and small markets throughout the greater portion of the country.

### STANDARDIZATION AND INSPECTION

Greater progress was made during the past year than ever before in the formulation of standard grades for fruits and vegetables. In fact, the number of fruits and vegetables for which grades were formulated was doubled during the past year. This work was stimulated by the fact that uniform grades are essential to the success of the shipping-point inspection service, which has expanded greatly in an effort to meet the requests of producers and shippers for this service. The demand has from the beginning been greater than the bureau could meet with the funds available for the purpose, although substantial increases in appropriations have been granted by Congress from year to year. It should be noted that inspections are made upon request only, and that fees are collected for the service rendered, which are turned into the Treasury of the United States, thus making the service largely self-supporting.

Seventy-three thousand cars of fruits and vegetables were inspected during the fiscal year 1923, 129,000 during 1924, and there is prospect of a further increase during the current year. Developments of economic significance under the inspection service are, first, that it is now possible for a producer to sell f. o. b. shipping point to a distant buyer on the basis of the Government certificate of inspection, and, second, that a practical program of grading at producing points has been enforced, which has resulted in preventing the shipment of large quantities of deteriorated and unsalable products, which bring nothing but losses to producers because of the fact that the handling and shipping charges must be met even though the product can not be sold on arrival at market. Proper grading on the farm also insures the consumer of getting better products for the same cost.

The timothy and clover grades were revised during the year and very satisfactory progress was made in the inspection service on hay. Work is well under way leading to the promulgation of standards for alfalfa, wild hay, and Johnson grass, and an inspection service on these classes of hay will be begun during the coming year.

An inspection service has been inaugurated on eggs at Chicago and New York which is proving very popular. The grades developed by the bureau are used as the basis of this service. The butter-inspection service has been expanded largely through cooperative arrangements with associations which are desirous of establishing the Federal-inspection service. Standardization work has been conducted also in connection with many other products. This work will be covered in detail under the commodity divisions.

### CONSUMER DEMAND STUDIES

The market news and other services of the bureau furnish information with regard to the supply, movement, prices, etc., of farm products. It is necessary also that information be secured with regard to the demand for such products. This bureau has recently taken up the study of consumer demand and is gradually working out methods by which this demand may be forecast. Studies of this nature have been carried on in Boston, Philadelphia, Chicago, Pittsburgh, and other cities and in the vicinity of a large number of growing cities throughout the country. It has been found that cities often draw their supply of food products from distant points when such products could be produced more profitably in the immediate vicinity. In each case, after the locality has been surveyed, recommendations are prepared and made public, and it has been found that in all cases these recommendations have been adopted very largely in planning the future production programs.

### WORK OF BUREAU ENLARGED

During the last two sessions of Congress a number of acts have been passed which enlarge and strengthen the work of the bureau. The first of these were the amendments to the United States warehouse act of March 23, 1923. The warehouse act formerly applied to only four commodities, i. e., cotton, grain, wool, and tobacco. Through these amendments the limitation was removed, and now warehouses may be licensed for the storage of any agricultural products which the Secretary of Agriculture may deem properly storable. During the past year investigations preliminary to drafting regulations for the storage of peanuts, potatoes, broomcorn, beans, nuts, hay, dried and canned fruits, apples, and cane sirup were made. Regulations for the storage of peanuts were pro-

mulgated on September 29, 1923; for the late crop of potatoes on May 10, 1924; for broomcorn on May 16, 1924. Regulations for the storage of dry edible beans have been drafted and will be submitted for promulgation in time to take care of the coming season's crop.

On March 4, 1923, the United States cotton standards act was approved. This act makes the use of the official cotton standards of the United States mandatory in interstate and foreign commerce. As a result of the passage of this act universal standards for American upland cotton have been promulgated and are now being used as the basis for trading throughout the world. This act provides also for the classing of spot cotton by licensed agents of the department for anyone who seeks the service.

On May 3, 1924, an act authorizing the Department of Agriculture to issue semimonthly cotton crop reports and providing for their publication simultaneously with the ginning reports of the Department of Commerce was passed. Much preliminary work was done before the close of the fiscal year in order to put this legislation in effect on August 1, 1924, as provided by law. With the inauguration of this service the cotton industry will be provided with more complete information than ever before.

### ORGANIZATION OF THE BUREAU OF AGRICULTURAL ECONOMICS

The principal divisions of the bureau as organized at the close of the fiscal year are as follows:

#### ADMINISTRATION

HENRY C. TAYLOR, *Chief*.  
 LLOYD S. TENNY, *Assistant Chief*.  
 WILLIAM A. SCHOENFELD, *Assistant Chief*.  
 J. CLYDE MARQUIS, *Director of Economic Information*.  
 C. W. KITCHEN, *Business Manager*.  
 F. J. HUGHES, *Personnel*.  
 H. F. FITTS, *Administrative Assistant*.

#### PRODUCTION DIVISIONS

*Farm Management and Costs*.—M. L. WILSON.

Farm organization.  
 Livestock costs.  
 Crop costs.  
 Types of farming.  
 Farm records and accounts.  
 Crop and livestock adjustments.

*Crop and Livestock Estimates*.—W. F. CALLANDER.

Crop Reporting Board.  
 Research in statistical methods.  
 Livestock reporting.  
 Tabulating and computing.  
 Crop reporting.  
 Price reporting.

## MARKETING DIVISIONS

*Cotton*.—A. W. PALMER.  
 Supervision of cotton futures and cotton standards acts.  
 Cotton standardization and classification.  
 Cotton market news.  
 Research in cotton marketing and handling methods and costs.  
 Research in cotton standardization and spinning qualities.  
 Standardization of cottonseed and products.  
 Foreign competition and demand.  
*Fruits and Vegetables*.—W. A. SHERMAN.  
 Market news service.  
 Inspection service.  
 Grades and standards.  
 Standard containers.  
 Research in marketing methods and costs.  
 Foreign competition and demand.  
*Livestock, Meats, and Wool*.—C. V. WHALIN.  
 Market news service.  
 Livestock marketing investigations and market movements.  
 Livestock grade standardization.  
 Purebred livestock marketing investigations and prices.  
 Meat marketing investigations.  
 Meat grade standardization.  
 Meat grading service.  
 Market research analysis and cost studies.  
 Wool marketing and standardization.  
 Foreign competition and demand.  
*Cost of Marketing*.—A. V. SWARTHOUT.  
*Operation of Center Market*.—C. W. KITCHEN.  
*Grain*.—H. J. BESLEY.  
 Grain investigations.  
 Milling and baking investigations.  
 Research laboratory.  
 Establishment of grades for barley.  
 Rice standardization and investigations.  
 Grain cleaning.  
 Bulk handling.  
 Methods and costs of marketing grain.  
 Federal grain supervision.  
 Foreign competition and demand.  
*Dairy and Poultry Products*.—ROY C. POTTS.  
 Market news service.  
 Dairy inspection service.  
 Dairy products investigations.  
 Poultry products investigations.  
 Research in marketing methods and costs.  
*Hay, Feed, and Seed*.—W. A. WHEELER.  
 Market news service.  
 Hay marketing investigations.  
 Feed marketing investigations.  
 Seed marketing investigations.  
 Hay standardization.  
 Hay inspection service.  
 Broomcorn market investigations.  
 Standardization of beans and peas.  
*Warehousing*.—H. S. YOHE.  
 Grain warehousing.  
 Wool warehousing.  
 Tobacco warehousing and standardization.  
 Cotton warehousing.  
 Fruits, vegetables, and nuts warehousing.  
 Broomcorn warehousing.

## GENERAL DIVISIONS

*Agricultural Finance*.—NILS A. OLSEN.  
 Farm credit.  
 Farm taxation.  
 Farm insurance.  
*Statistical and Historical Research*.—O. C. STINE.  
 Foreign competition and demand.  
 Market statistics.  
 Production statistics.  
 Transportation.  
 Statistical analyses.

*Statistical and Historical Research*.—Con.  
 Agricultural history.  
 Graphics.  
*Agricultural Cooperation*.—CHRIS L. CHRISTENSEN.  
 Economics of cooperation.  
 Statistics of cooperation.  
 Legal phases of cooperation.  
 Accounts and business practices of cooperative associations.  
*Farm Population and Rural Life*.—C. J. GALPIN.  
 Farm population statistics.  
 Population aspects of rural community buildings.  
 Farmers' standard of living.  
 The farm village.  
*Economic Library*.—MARY G. LACY.  
*Land Economics*.—L. C. GRAY.  
 Land resources and utilization.  
 Land reclamation, sale, and settlement.  
 Farm labor.  
 Land tenure.  
 Land values.  
*Division of Information*.—J. C. MARQUIS.  
 Editorial.  
 Periodicals and press service.  
 Radio news service.  
 Exhibits and motion pictures.  
 Consumer demand research.

## DIVISION OF FARM MANAGEMENT

H. R. TOLLEY, *In Charge*

*Farm Practices and Types of Farming*, W. J. SPILLMAN; *Organization of Southern Farms*, C. L. GOODRICH; *Organization of Irrigated Farms*, BYRON HUNTER; *Farm Records and Accounts*, J. W. TAPP; *Farm Business Analysis*, H. W. HAWTHORNE; *Farm Incomes*, S. W. MENDUM; *Farm Power*, L. A. REYNOLDS.

The Division of Farm Management seeks to bring about the practical application of the principles of farm management and to bring to farmers just the type of information which they need to enable them to meet their specific local problems. Effort is made to assist farmers in adjusting their programs to meet the changing agricultural conditions. This assistance is given first by putting within the farmers' reach all possible information with regard to world production of agricultural products and the prospective demands for such products; and, second, by furnishing authentic information on methods of organizing and managing farms which are proving most successful. In order to be of most benefit, representatives of this division study local problems with a view to making recommendations which will meet the peculiar local conditions. In all this work close cooperation is maintained with other divisions which handle land utilization problems, studies of costs of production, crop and livestock estimates and marketing problems, and with State experiment stations and extension divisions.

#### AGRICULTURAL READJUSTMENTS IN AREAS SURROUNDING GROWING CITIES

Very helpful work has been done in assisting farmers in areas surrounding many growing cities to readjust their production programs. Changes in transportation costs have made many adjustments desirable; as where food products were formerly produced under more favorable soil and climatic conditions and shipped long distances, present freight rates make it more desirable to produce these products closer at hand. Owing to lack of information with regard to local demands, foods are often shipped great distances when they might be produced with profit in the immediate neighborhood.

Studies of areas around cities designed to determine to what extent farmers are meeting the needs of their local markets were made at Altoona, Pa., Fayetteville, N. C., Charleston, W. Va., and Richmond, Ind. The findings of these studies are being used as the basis of the agricultural program for the different areas. These studies determine the amounts of different foodstuffs consumed in the area, the places where these foodstuffs are produced, the agricultural production in the area, the part of the agricultural production consumed in the area, the part shipped to distant markets, the possibility of increased profits to the farmers of the area through increased production for the local market, and other changes in production and marketing practices that would result in greater profits to farmers or lower costs of food to the consumers. During the latter part of the year similar studies were begun at Macon, Ga., Lebanon, Pa., Roanoke, Va., and Atlantic City, N. J. Other divisions of the bureau and the State colleges and experiment stations have assisted in all these studies.

#### AGRICULTURAL READJUSTMENTS IN THE SPRING-WHEAT REGION

This study, begun the previous year by this division and the Division of Land Economics in cooperation with the State colleges and experiment stations in North Dakota, South Dakota, and Montana, was practically completed during the year. Between 600 and 700 farmers in the area were visited, reports of their financial progress since settling were obtained, and from their experience an effort has been made to determine the systems of farming best adapted to the region.

When completed this material will be placed in the hands of extension forces in the region and assistance given in placing the findings before the farmers. Much educational work has already been done in assisting farmers to diversify their program of production and it is expected that the facts secured by this study will go far toward answering the needs of farmers for authentic information with regard to possibilities of future development of a profitable agriculture in this region.

#### COST OF PRODUCING MILK

From a farm-management survey made in Chester County, Pa., records were obtained from 424 farms. In addition to data on the entire farm business, complete figures were obtained on the operation of the dairy enterprise. Dairying is the keystone of the farming system of Chester County, but there are wide differences in the efficiency with which milk is produced. The first analysis of the data was therefore directed to an "input-output" study of the dairy enterprise. A preliminary report entitled "Farm Practices which Determine Profit or Loss in Milk Production in Southeastern Pennsylvania" was published, giving the results of this study. This report showed the specific practices that determine the efficiency of milk production, and made concrete suggestions as to methods of making improvements; that is, as well as showing that there were wide differences in cost of production, it showed specific ways in which farmers in the area may reduce that cost. Copies of this preliminary report were sent to all farmers from whom records had been obtained. Meetings were held in Chester County in cooperation with the county agent during the winter to discuss this report with the farmers. These meetings were attended by more than 250 men, and much interest in the results was displayed. A summary of the dairy enterprise results on their own farms was sent to each of the farmers surveyed who attended these meetings. In addition, upon request the county agent was sent copies of the dairy-enterprise record for all men whose herds were doing poorly, so that he might visit them and help better their dairy practices. A further study of the organization of the farms surveyed to determine the other factors necessary to profitable farming in the region is now under way.

## FARM RECORDS AND ACCOUNT WORK

The analysis and publication of material collected on the farm records and accounts routes conducted jointly by the bureau and various State colleges and experiment stations was continued. During the year a representative of the division assisted in preparing reports covering studies of farm organization in southwestern Minnesota, in central Kansas, and in the Gallatin Valley, Mont. A manuscript entitled "More Profits for the Wheat Farmers of Central Kansas" was also prepared for publication.

The object of this work is to assist cooperating farmers to reorganize their farms for greater profit and to obtain material which will be useful to other farmers similarly situated in determining what readjustments they might make profitably. That this work is producing results is evidenced by numerous reports received from producing sections and from the ever-increasing requests for this type of assistance. Increasing effort is being made to bring the results of the research work directly to the farmers concerned. In this the bureau is assisted by the Extension Service of the department, by State organizations, and others.

## RESEARCH METHODS IMPROVED

A new method of analysis for determining the definite relations between goods or services used up in production and the resulting output, together with means for determining what combinations of practices are most profitable under specific price conditions, was perfected during the year and published in a bulletin entitled "The Relation of Input and Output in Farm Organization and Cost of Production Studies," so that it will be available to other research workers. The statistical method employed was tested and found satisfactory, and a technical article describing it prepared for the Journal of the American Statistical Association. A special study to find the best method of determining the value of different classes of labor on the farm was practically completed.

## TYPES OF FARMING

A study of the geographical distribution of types of farming was continued, and data obtained from censuses of 1909 and 1919 for relative crop areas and number of animals per

100 acres of crops were compiled and charted by counties for all States. These data are of value in outlining agricultural programs and are in demand from National and State extension services.

## IRRIGATED FARMING IN IDAHO

A study of irrigated farming in southern Idaho begun in former years was practically completed. The final report on this study deals with the principal changes which have taken place in crop and livestock production during the development of the area studied, the causes of these changes, the present types of farming and methods of production, and the factors which contribute to success or failure in the organization and management of the farms. Much interest has been shown in late years in irrigated agriculture, and the final report of this study will be of much interest and helpful to the farmers of the Twin Falls south side project, where the study was made; to other farmers on irrigation projects where conditions are similar to those of Twin Falls, and to settlers who during the coming years will undertake to develop farms from the raw sagebrush on irrigation projects yet to be undertaken.

## IRRIGATION IN THE YAKIMA VALLEY

The two-year study of farm organization and production problems on irrigated farms in the Yakima Valley, Wash., was completed this year. The study was cooperative between the state college of Washington and the Bureaus of Plant Industry and Agricultural Economics. A bulletin covering the results of the survey is now nearly completed, which shows how a farmer in this area can best work out the most successful farm organization for his particular conditions.

## PRISON FARM SYSTEM IN TEXAS

The Agricultural and Mechanical College of Texas asked the division to assist it in studying the organization and operation of the 14 prison farms of that State, on which approximately 4,000 prisoners are employed, with a view to determining how the farms might be made to yield greater profits, and how the conditions of the prisoners working on these farms could be improved. A representative of the division spent three months on the farms and left with the col-

lege authorities a large number of recommendations, which when put into effect will do much toward placing the prison system of the State on a self-supporting basis.

### STUDIES IN SOUTHERN STATES

Farm management studies undertaken in former years for the purpose of obtaining information on which to base sound recommendations for changes in farm organization and operation were continued in cooperation with the States of South Carolina, Georgia, Mississippi, Arkansas, Louisiana, and Virginia.

### REPORTS ON SUCCESSFUL METHODS

Records of farming operations and results obtained in former years were analyzed. The following reports are being published: "Successful farming on 80-acre farms in central Indiana," "Successful farming on 160-acre farms in central Indiana," and "Value to farm families of food, fuel, and use of house." The latter contains data from 30 localities in 21 States from 1918 to 1922, and is based on records from 7,738 farms.

"Analyze your business," a lecture illustrated with lantern slides, has been prepared for use through the Extension Service of the department. Assistance was given also to the Extension Service of the department in writing a scenario and filming a motion picture entitled "Citrus Fruits in Florida." The object of the picture is to show successful methods and practices in managing citrus groves and in handling and marketing fruit.

### RETURNS FROM FARMING MEAGER

In order that authentic information might be obtained the collection and compilation of incomes from farming begun in former years was continued and expanded. Reports of receipts and expenses for the calendar year 1923 from over 16,000 farmers were obtained and tabulated. These reports showed an average return of \$1,020 for the use of \$17,500 of capital and the labor of the farmer and his family. The average cash receipts were \$2,240, inventories increased \$130 during the year, and the average cash outlay was \$1,350. In addition the average farmer produced food and fuel consumed on the farm estimated to be worth \$250 and had the use of the farmhouse, the rent of which was

not reported. Interest paid on debts during the year averaged \$230, and the reported outlay for improvements averaged \$140. Although returns were low there was some improvement over the previous years. Figures from 6,000 similar farms for 1922 showed average cash receipts of \$1,972, increases in inventories of \$202, an average cash outlay \$1,257, and food and fuel produced and used on the farm to the value of \$294.

This question of the farmers' returns has also been attacked from a different angle in the Division of Statistical and Historical Research. In this study the total value of all agricultural production, the total value of all capital invested in agriculture, the total farm indebtedness (mortgage and other), changes in inventory values, and all operating expenses were considered. The values derived for the total net income from agriculture available for farmers' net investment and for the management and labor of farmers and their families during the past 5 years ended June 30 were as follows:

1920-----	\$8,143,000,000
1921-----	4,773,000,000
1922-----	3,588,000,000
1923-----	4,459,000,000
1924-----	4,887,000,000

The percentages derived, after interest on debt and an average hired-labor wage for operators were subtracted, show that for the crop year 1919-20 the return on the farmer's capital investment was 5.8 per cent. For the crop year 1920-21 this return dropped abruptly to the figure —3.1 per cent. Since that time the rate of return has somewhat improved and for 1923-24 stood at 1.4 per cent. It should be noted also that farmers experienced a deflation of property value by which the worth of capital investments owned by farm operators dropped from \$48,500,000,000 to \$33,422,000,000 in these four years.

This study also determined the rewards for the farmer's labor and management after allowing a commercial interest return on the operator's capital investment. It was shown that the average farmer and his family earned \$932 in 1919-20, \$299 in 1920-21, \$292 in 1921-22, \$454 in 1922-23, and \$520 in 1923-24. Except for 1919-20 the farmers received rewards for their own and family labor and their managerial services which were lower than the annual wages of hired labor.

## DIVISION OF COST OF PRODUCTION

R. H. WILCOX, *In Charge*

Farm Records and Accounts, O. A. JUVE;  
Crop Costs, M. R. COOPER; Livestock  
Costs, G. S. KLEMMEDSON and R. D. JEN-  
NINGS; Cost and Price Relations, C. R.  
HAWLEY.

The Division of Cost of Production has centered its work upon answering those problems in farm practices, methods and organization with which the farmers of the United States are confronted. Studies of the cost of producing farm products and the relation of costs to prices are carried on in order to help the farmer in determining the most productive and profitable types of livestock and crops to produce and the most efficient methods to employ in the management and production of crops and livestock. A number of bulletins have been prepared for publication during the past year, as well as preliminary reports, mimeographed releases, and other types of information containing data of value to farmers, extension workers, and others.

### FARM ACCOUNTING WORK

Farm records and accounts work is carried on cooperatively by this division with 13 State colleges and experiment stations. The purpose of this work is to make available to farmers the essential factors of good farm organization and to show how to organize farms for the maximum income. This work was expanded during the past year by beginning three new field studies in cotton and tobacco areas, where but little information has heretofore been available. It is expected that these new studies will help to facilitate the adjustment which farmers in these areas are making, as a result of boll-weevil damage to cotton and changing price relations. Each farmer contributing to these studies is supplied with forms upon which complete records are kept, showing for each crop the amount of labor, machinery, cash expenses, and other elements of cost. The keeping of such records enables the farmer to put his operations upon a business basis, besides furnishing the department with valuable records.

### PRACTICAL USE OF MATERIAL

Renewed efforts were made during the year to develop methods of analysis and presentation that would make the material collected of greatest usefulness to farmers. New projects are

being initiated with the idea of making the material collected more quickly available for the use of farmers and extension agencies. The material presented enables farmers to check up their methods and costs and compare their own operations with the standard of their own community and with that of other sections.

### ASSISTANCE GIVEN CATTLEMEN

In the study of livestock farming the work in ranch economics was expanded to include studies in Colorado and Texas. It has been the purpose of this study to analyze ranch organization, including the distribution of investment, kinds and quality of land and forage, and the distribution of land area, to study the factors of production available upon each ranch with a view to determining the most profitable uses to which these factors of production may be placed. From the study of ranch organization and cost of production on 56 ranches many valuable suggestions have been made through published reports and personal visits. Closely related to the work in ranch organization has been the study of the handling of cattle during the summer on the short grasses of the Flint Hills of Kansas. This year saw the termination of a three-year study in Chase County, Kans., upon 35,000 head of cattle. The object of this study was to obtain the fundamental basic requirements of pasture area, feed, labor, and miscellaneous-cost items in beef production and to study the economic position of summer grazing of cattle in Kansas in its relation to the beef-cattle industry and to the markets for livestock. In addition to the work upon ranches, an investigation was made into the costs of carrying cattle on the national forest ranges of the West. In continuing the work on the cost of fattening cattle in the Corn Belt, the data covering five years' work have been analyzed and prepared for publication.

### PRODUCTION OF HOGS AND DAIRY PRODUCTS

The study of the cost of producing hogs has been expanded during the past fiscal year to cover approximately 150 farms. On these farms there is being secured facts regarding the management of swine herds and the feed and labor requirements on hogs that are handled under the different methods of pork production practiced in the Corn Belt. Cooperative

studies have been continued with New York on the cost of producing dairy products. It has been the purpose of this dairy-cost work to study the requirements of production for milk of different grades and from cows varying in production capacity and to place in the hands of producers information upon the organization of farms for maximum income.

#### PRODUCTION OF CORN, WHEAT, COTTON, AND POTATOES

The costs of producing corn, wheat, and oats during 1922 were secured throughout the United States and results of this study published in September, 1923. Costs of producing corn, wheat, cotton, and potatoes were secured by questionnaires. The number of schedules used in these tabulations were as follows: Corn, 11,238; wheat, 7,852; oats, 8,481; potatoes, 2,694; and cotton, 2,519. During June further detailed tabulations were made, and a more detailed report of 1923 costs is being prepared. About 10,000 questionnaires were sent out on labor requirements in the production of cotton, and the tabulation of this material is well under way. Over 780 cotton-cost records have been obtained in 15 counties of the eight Cotton States. Additional information on cost trends of taxes, labor, fertilizer, machinery, and ginning from 1913 to 1923 were obtained in this survey. It is the object of this study not only to show the cost of producing cotton in 1923 but by the use of cost figures for the past 10 years to show the trends of costs and their relationship to the things the southern farmer has to purchase. In a cotton study in Anderson County, S. C., 333 farm-survey records were obtained and reports prepared. The facts established by these cost studies are given wide publicity, and care is taken to carry the information back to the particular regions studied so that farmers whose operations are studied may have a guide for future operations.

#### FRUIT PRODUCTION

Studies have been made of the apple production in the Shenandoah Valley and of the costs of producing peaches in New Jersey. Final tabulations for the six-year citrus fruit study in Florida have been completed. During July and August, 1923, strawberry cost records were obtained on 35 farms for the years 1921, 1922, and 1923. These data were tabulated and are being combined with records taken in July, 1924, covering costs for 1922,

1923, and 1924. Farm business analysis records were obtained also on 35 farms for 1922 and on 25 farms for 1923. A great many of these studies are made in response to inquiries from particular sections for this information. The cost studies are showing results in many sections where the farm programs are being modified so as to yield larger net results.

#### COST RECORDS OF PRACTICAL VALUE

Cost records have been kept on a large number of products for the purpose of securing authentic information with which to answer the many inquiries received. Farmers are awakening to the fact that haphazard methods can no longer be followed, that the program of production bears a close relation to the costs involved, and that production which can not pay for the costs and yield a profit must in many cases be eliminated. Cost records were kept during 1923 on 100 crops of tobacco, surveys were made on 80 tobacco farms, and complete records were kept on 5 tobacco farms. A preliminary report was published on the cost of raising Virginia dark and bright tobacco in south-central Virginia for 1922. Cost records have been kept also on the cost of producing corn in Indiana and Iowa, on the cost of producing wheat and incomes from farming in eastern Washington and northern Idaho, and the cost and utilization of tractor and horse power in Sherman County, Oreg.

#### DIVISION OF CROP AND LIVESTOCK ESTIMATES

W. F. CALLANDER, *In Charge*

Crop Reporting Board, W. A. SCHOENFELD, Assistant Chief of Bureau, chairman; Research in Statistical Methods, J. A. BECKER; Field Service, C. E. GAGE; Tabulating and Computing Section, F. J. BLAIR; Price Reporting, L. M. HARRISON.

Very marked improvements have been made in the statistical work of this division during the past year. New and improved methods have been devised and the statistical staff has been strengthened by the transfer to Washington of three of the best trained and most experienced field statisticians of the division—one to handle livestock reports, one for cotton work, and one for grain work. It would be desirable to add at least two more commodity statisticians to the Washington force in order to give the various reports the analysis and study that are essential to secure the best results.

### SEMIMONTHLY COTTON REPORTS

One of the most important developments of the past year was the enactment by Congress of legislation providing for semimonthly cotton reports between July 1 and December 1, with the further provision that the reports from August 1 to December 1 shall be issued simultaneously with the cotton ginning reports of the Bureau of the Census. The law provides that these reports shall be issued on the eighth day following that to which they relate. The first report under the new law was issued on July 21. The issuance of these new reports will practically double the number of cotton reports, and it has made it necessary to increase materially the personnel in the field offices in the cotton-producing States because of the fact that not only were additional reports provided for but the date for issuing the regular monthly reports was changed from the 25th of the month to the 1st, and a great deal of investigation and study has been necessary in order to develop a system of pars for dates upon which the department had never issued a report before.

### FALL REPORT ON "INTENTIONS TO PLANT"

In August, 1923, the first fall report on intentions to plant winter wheat and rye was issued, and in March the second spring report on intentions to plant was issued, covering spring-sown crops, with the exception of cotton. These reports, while severely criticized in some quarters, are meeting with general favor on the part of a great many intelligent farmers and have now become an important part of the work of the division. There is no doubt that work of this character which furnishes the farmers information in advance of planting of the general trend of acreage will, when properly understood and used, go far toward bringing about a better adjustment of agricultural production. A provision included in the act requiring semimonthly cotton reports prohibits the department from making intentions-to-plant reports on the cotton crop, and as a result of this provision no report was made this year on the intentions of farmers to plant cotton.

### METHODS OF ESTIMATING ACREAGE

In the report of last year reference was made to the development of a "crop meter" to be used in determining the changes which were taking

place from year to year in acreage. This machine, which is in the nature of a multiple speedometer attached to an automobile, records the number of linear feet along selected areas that are planted to various crops, and a number of these machines have been used during the spring months this year. In practically all of the States where they have been used the field statisticians are enthusiastic about their possibilities, and it is proposed to equip all the field offices with these machines before another year. It is proposed to cover identical roads from year to year, noting the number of feet along each road in each crop, making comparisons and estimating changes based on these measurements. This machine is also being found extremely useful in recording the abandonment of crops, especially cotton. This is done by covering some roads from month to month during the season, measuring the number of feet in cotton. The reduction from month to month indicates the acreage which has been plowed up and put into other crops. It is also extremely useful in recording the progress of work during the season where trips are made frequently over the same routes.

### PRICE STATISTICS

A marked improvement has been made in the handling of price statistics gathered by the bureau during the year. On January 1 a trained statistician was placed in charge of collecting and compiling price data, and the number of reports has been greatly increased. Prices are now being collected monthly, not only on practically all products the farmer has to sell but on about 70 typical articles which he has to buy. A closer study of the spread between farm and retail prices can thus be made. A compilation of price data is being made, which will contain valuable price statistics collected by the division.

### LIVESTOCK REPORTING WORK

**Special hog reports.**—The livestock reporting work has been further developed, particularly in connection with the pig surveys made through the rural carriers. These reports are demonstrating their value and are proving to be very accurate indications of the future supply of hogs at the central markets. A study of the relation between the increase or decrease in the number of sows farrowed and the receipts at the stockyards in

subsequent months demonstrates that the changes in the number of sows farrowed from year to year forecasts almost exactly the change in the number of hogs that will be received at the stockyards the following season. The June survey indicates the number of spring pigs that will be marketed between the following October and May, and the fall survey indicates the number that will be marketed the following summer. The reports on the intentions of farmers to breed sows have also proved their value and are affording the farmers of the country a basis for readjusting their production in order to keep it more in line with the probable demands of the market.

**Special dairy and poultry reports.**—The pig surveys have been expanded to include dairy cows, and a very extensive report was received on June 1 of this year, which indicates that there has been a material increase in the number of dairy cows on farms during the past year, and that the number of heifers between 1 and 2 years of age is relatively high compared to 1919, when the last census was taken. It shows, furthermore, that the number of calves being kept for dairy cows this year is considerably below the number kept last year, indicating that the drop in the price of dairy products is tending to reduce the number of heifer calves being raised for dairy cows. The report shows the most striking increases in North Dakota, Montana, South Dakota, and other far-western States, indicating that these States are gradually diversifying their farm program. It is proposed to make a dairy survey twice a year in connection with the pig surveys, and next December a poultry survey will be included.

#### CATTLE AND SHEEP REPORTS

The work of organizing the information obtained during the past year and a half from stockyards, packing plants, railroads, and other agencies actively engaged in the process of marketing livestock has been well advanced, and at the present time the source of the market supplies of cattle and sheep for four years, 1920 to 1923, inclusive, is substantially established. It is now known where the supply comes from for each season and month during these years, which makes it possible to forecast the probable effect upon market supplies of unusual conditions in different areas. Within the various important livestock-producing

States information is now available also showing the local areas into which and from which cattle and sheep move, the time of movement, and the approximate amount of locally produced and imported stock in the market shipments.

The experience of the past year has demonstrated that much more travel and field work must be done in order that dependable information may be secured and close touch with changing conditions maintained, and to this end the western region has been divided into two areas, and an experienced livestock man will be placed in charge of each area. These men will spend most of their time in travel, securing first-hand comparable information from different States while working in cooperation with the State statisticians.

The work of estimating cattle and sheep on feed has produced satisfactory results during the past year to the extent at least that these estimates have indicated with reasonable accuracy the subsequent trend of marketing. The great handicap in this work continues to be in getting adequate and dependable information from feeders. Work of an educational nature with producers' organizations and through the agricultural press is needed to secure full cooperation in getting information from the men for whose benefit this work is being done.

Additional work was done in securing and releasing information on the weekly and cumulative car loadings of sheep during the feeding season in the important western feeding areas. During the coming year it is hoped to improve this service and through cooperation with various wool-growers' associations to extend it over the balance of the year, thus covering the important western grass movement.

The monthly reports on western livestock and range conditions are proving a source of information as to current conditions in different States and also make possible comparisons with those of last year. After several years' records are available they should prove valuable indexes of market movements. With the basic information which is being developed as to the origin of livestock supplies and of seasonal market movement it is anticipated that future reports and estimates will be of greater value both because of increased accuracy and the inclusion of more specific details.

## USEFULNESS OF STATISTICS

A rapidly growing interest in and a greater practical use of agricultural statistics by Federal and State extension workers has been one of the developments of the past year. So great has this interest become in some States that the directors of extension have offered office quarters and extra clerical help in order that crop and livestock information may be developed in much greater county detail than the funds of this division permit. Cooperative arrangements to this end have been made with a number of States and in others negotiations are pending.

During the winter two of the best trained agricultural statisticians of this division were detailed to the Extension Service for four months. They visited a number of States in order to carry on extension work in statistics and to demonstrate how such information could be best utilized by county agents and farmers. It was their duty to find out to what extent agricultural statistics now published failed to meet the needs of this large group of agricultural workers. Much valuable information which will aid in developing the work along practical lines was secured.

Cooperative arrangements have been entered into with each State which has a system of crop reporting and all such crop reports are now issued in cooperation with the Department of Agriculture. A joint system of crop reports is now in effect in 27 States.

## CROP REPORTING METHODS

The statistical research section of the division has studied the relationship between crop-condition figures and final yields. For all important crops the data have been analyzed to determine the correlation between crop conditions as reported by the crop reporters of the bureau during the growing season and the final outturn in terms of yield per acre as reported by them at time of harvest. This study has indicated that there is sufficiently high correlation during most of the season to warrant a forecast of yield based upon condition, and that for the United States as a whole, conditions do give a good indication of the direction in which the crop is tending.

In connection with the estimates of cotton an analysis of the relation between condition and abandonment of acreage has been made. Sufficiently

high correlation was found to justify a forecast of abandonment from condition, and within the next few years the bureau undoubtedly will use this information in its crop forecasts.

Study has been given also to the relative merits of various methods of estimating acreage. Wherever a check of acreage, based upon annual enumeration, is available over a series of years, the various methods used in estimating the acreage have been analyzed to determine the relative accuracy of the results. Special attention has been given to the determination of the diversion between the results of certain methods and the actual fact as shown by enumerations, with a view to measuring the statistical bias which exists in certain types of report.

The groundwork has been laid of a systematic study for determining the various factors in crop production which bring about a change in condition of crops as the season advances. All crop forecasts at the present time give an indication of the size of the crop should subsequent influences be average. To assist in making closer and more accurate approximations of the final outturn of crops, it would be desirable to determine the factors which bring about a change in crop condition subsequent to a given date. When these influences are determined and the relative effect of the various influences measured a mathematical interpretation of those factors which are known in advance should assist materially in securing a closer approximation of the probable size of the crop. In addition to the study of the factors which bring about a change in condition, the bureau has begun a study of the relation of certain factors of crop production in the final yield irrespective of the condition at given dates. Under this heading are included not only weather factors but also the effect of economic conditions and factors, such as the quantities of fertilizers used and the relative scarcity of farm labor.

## FOREIGN CROP REPORTING

During the past year one of the statisticians of the bureau spent three months in Europe. While abroad he was a delegate to the International Institute of Agriculture at Rome and obtained first-hand knowledge of the scope of the study and methods used in preparing its reports. He also visited the various statistical bureaus in 11 of the European countries with a view to securing first-hand information of the methods used in compiling

crop estimates, index numbers, and import and export statistics in the various countries. Particular attention is being given to an analysis of the methods used and to the relative accuracy of the results obtained.

### AGRICULTURAL CENSUS

During the spring months the statistician in charge of the division acted as a member of the department committee which has cooperated with the officials of the Bureau of the Census of the Department of Commerce in drawing up the schedule for the forthcoming agricultural census of the United States as of January 1, 1925. In accordance with an agreement between the Secretary of this department and the Secretary of Commerce, a considerable part of the time of the field staff during the fall and winter months will be spent in aiding the Census Bureau to take the agricultural census.

### DIVISION OF COTTON MARKETING

ARTHUR W. PALMER, *In Charge*

Classification of Cotton, H. C. SLADE; Preparation and Distribution of Official Cotton Standards, H. C. SLADE; Future and Spot Market Investigations and Cotton Price Quotations, A. M. AGELASTO; Cotton Testing, WILLIAM G. BLAIR; Investigation and Demonstration of Cotton Standards, GEORGE BUTTERWORTH; Cotton Marketing Demonstrations, G. S. MELOY; Research in Cotton Marketing, A. B. COX.

An unusually heavy program of activities in connection with cotton marketing has been carried out during the past year. One of the outstanding accomplishments was the completion of negotiations with the principal cotton exchanges of Europe for the adoption of the universal standards for American cotton. Legislation enacted in March, 1923, making mandatory the use of the official cotton standards of the United States in interstate and foreign commerce, brought about a resumption of negotiations between the Liverpool Cotton Association and the Department of Agriculture which culminated in an international conference held in Washington, D. C., in June, 1923. This meeting was attended by all the most important mercantile organizations in the cotton trade of Europe. In deference to their wishes, the department agreed that the standards for grade and color should be known as the universal standards. In adopting the standards, however, the Liverpool association stipulated that cer-

tain modifications should be made. A second conference, therefore, was called on July 18, 1923, at which delegates from the Liverpool and Manchester associations acted for the European exchanges. The American trade interests were represented also by leading merchants, exporters, spinners, and farmers. The conference recommended several minor changes in the standards and on July 30, 1923, under authority of the United States cotton standards act the Secretary of Agriculture published an order putting into effect the proposed changes, effective August 1, 1924. During May, 1924, Liverpool representatives filed certain criticisms of the copies of the standards which had been shipped by this department. As a result of this criticism the chief of this bureau agreed that representatives of the foreign exchanges should come to Washington and that 15 sets should be passed upon and accepted by the European experts to be used by their arbitration committees in the various exchanges of Europe. Cotton experts from the Liverpool, Manchester, and Bremen exchanges and from the American cotton trade came to Washington on June 16, and as a result of their work 15 sets were accepted against the original set for use by the various exchanges.

Since that time, however, the Liverpool exchange has given notice of its intention to withdraw from the agreement entered into for the use of the universal standards. Negotiations are still pending and it is hoped that satisfactory arrangements can be effected. While under the present law the Department of Agriculture has adequate authority to make the United States standards mandatory in the sale of cotton in interstate and foreign commerce, every effort is being made to secure full cooperation with the European buyers and the movement toward establishing the universal standards as the basis for trading in American cotton in European countries will continue.

The demand for copies of the official standards has been unusually large during the past year, 201 full white sets, 653 fractional white sets, 141 full colored sets, and 133 fractional colored sets for Upland cotton having been shipped to purchasers in this country and abroad, in addition to a large number for American Egyptian cotton and standards for length of staple. The increased use of and the better understanding of the official cotton stand-

ards will lead to more satisfactory marketing of these products.

#### COTTON PRICE-QUOTATION SERVICE

The cotton price-quotation service has been continued along the same lines as in previous years. Under this service accurate quotations are secured on sales of spot cotton from 10 of the principal spot markets. These quotations are given the widest possible publicity through published bulletins, by telephone, telegraph, and radio, and through cooperation with newspapers in the South having a combined circulation of over 1,500,000 copies. A new feature of this work is the development of systematic reception and posting of radio quotations in interior markets. In addition to furnishing authentic, current information on prices, these quotations serve as the basis for the settlement of cotton other than middling delivered on future contracts made subject to section 5 of the United States cotton futures act. This work involves constant supervision in order that the most accurate quotations may be secured and that every means available may be used in bringing this information promptly to the persons interested.

#### COTTON DELIVERED ON FUTURE CONTRACTS CLASSIFIED

During the year in the regular classification work 196,213 bales of cotton were classified by the board of examiners at New York and 87,377 bales by the board at New Orleans. At New York 8,998 bales were submitted a second time for review and in the review the classification of 1,129 bales was changed. At New Orleans 1,165 bales were submitted for review and the classification of 195 bales was changed. In the preliminary sample classification work 2,219 samples were classified by the board at New York and 2,339 bales by the board at New Orleans.

The largest quantity of cotton handled in the regular classification work in any one month by a single board since the beginning of the work in 1919 was handled by the New York board in December, 1923, the figure being 129,815 bales. The volume of cotton classified by the bureau since the inauguration of the work in March, 1919, totaled 1,147,985 bales on June 30, 1924. The classification of cotton continues to be a self-supporting service, and the fees are increased or decreased as the condition of the

funds warrants. The fee for the classification and certification of cotton was increased from 20 cents to 30 cents per bale, effective August 1, 1923.

#### CLASSIFICATION OF SPOT COTTON

Section 4 of the United States cotton standards act, which became effective August 1, 1923, provides that any person who has custody of or a financial interest in any cotton may submit the same to the department for classification. The boards of cotton examiners already established at New York and New Orleans which classify cotton tendered for future delivery were designated to classify all cotton submitted for classification under the cotton standards act. In addition an appeal board of cotton review examiners was established in Washington the duty of which is to hear appeals from the classification performed by other boards appointed under the act. Boards of examiners will be established elsewhere when necessary. During the year 5,810 bales of cotton were classified by the board of cotton examiners at New York and 2,025 bales by the board at New Orleans. No appeals were submitted to the board of review in Washington.

#### LICENSING OF CLASSERS

The inauguration of Government classification of cotton involved in spot cotton transactions and the licensing of cotton classers were of decided advantage to the cotton trade. All cotton classified by the department boards of examiners and by the licensees must, of course, be classified in accordance with the official standards, so that it is hoped the results of the new work when thoroughly appreciated and taken full advantage of by the trade will be the complete dissemination of knowledge of the standards wherever trading in American cotton is carried on and the eventual adoption of the standards as the basis for all trading. Uniformity of classification and the use of a common language with respect to cotton grades in the world's trade in American cotton should go far toward the elimination of controversies and disputes and thus result in decided economies to all interests and in greater returns to the cotton producer for his product.

Authority for the licensing of cotton classers is contained in section 3 of the cotton standards act. The rules of the Secretary under the act require that a fee of \$10 shall accompany each application for a license

and that applicants may be required to submit to a practical examination in the classification of cotton to determine whether they are qualified to classify cotton properly. The rules also provide for the inspection of the records of all licensed classifiers by officers of the department to insure compliance with all provisions of the act with respect to licenses. Applications for licenses were received from 32 persons and licenses had been issued to 12 of these at the close of the year.

#### SPINNING TESTS OF COTTON

The cotton trade has been vitally interested in the results of the spinning tests made on various types of cotton and of cotton handled under various conditions. Tests have been made during the year of new varieties of cotton which are developed in the Bureau of Plant Industry, of the new official grades which became effective August 1, 1924, and of cotton subjected to various treatments. Individual fiber-strength tests have been made for cotton fumigated with sulphur dioxide.

Tests made in cooperation with the Bureau of Plant Industry of Pima or American Egyptian cotton included the "segregation" test, in which the inferior cotton was segregated from the normal run of the field; the "picking" test, in which the first, second, and third pickings were spun separately; the test in which a smooth-seeded variety of Pima cotton grown at Shafter, Calif., was spun against a fuzzy-seeded variety of Pima cotton grown at Sacaton, Ariz.; and a test in which the effect of ginning Meade cotton on a saw gin was checked against the same cotton ginned on a roller gin.

The tests of segregated Pima cotton showed that the "superior" longer staple cotton was less wasteful than the "inferior," but that the yarn produced was slightly weaker than the inferior cotton. As these two factors would largely offset each other, it was apparent that nothing was to be gained by field segregation of Pima cotton grown in the Salt River Valley of Arizona.

In the tests of the three different pickings it was found that the evenness of the yarn from the second picking was slightly better than the first picking and that the third picking was slightly better than the second. The third picking, though, was approximately 1.5 per cent more wasteful than the first and second. It was ap-

parent, therefore, that there was nothing to be gained by separating the different pickings. Tests on the Pima variety of American Egyptian cotton ginned under different moisture conditions showed that the value of this variety is improved by ginning under higher moisture conditions than normally prevail in Arizona. The improvement is noted by the decreased percentage of visible waste and the increased strength of the yarn.

Various other tests were conducted, usually in response to a need for specific information in regard to conditions in a particular locality. This work should be extended until all factors affecting grade and staple and other properties of cotton have been thoroughly studied. Numerous letters from cotton producers and spinners have been received with requests for the solution of problems which they have met, and assistance is being given wherever possible. Particular attention has been given to developing a new method of testing bulk strength of cotton, and it is expected that information along this line can be made public in the near future.

#### COTTON MARKETING STUDIED

The marketing research work has been devoted very largely to four lines of endeavor. The first is concerned with an analysis of the economics of cotton marketing. Particular attention during the past year has been given to a study of the functions of the different kinds of markets and their relationship to each other in such matters as price making, financing, and the physical movement of the cotton. A manuscript giving the results of the greater part of this study is nearly ready for publication.

The second line of study has been devoted to an analysis of the relationships between the cooperative marketing of cotton and marketing as a private business, in order to assist in improving the service rendered grower members, and in assisting the development along sound economic lines. The outstanding result of the studies in this field has been the decision of the cooperatives to adopt the universal standards as their types and to have their classifiers licensed under the authority of the cotton standards act and their work inspected by a classifier from the Cotton Division of the Bureau of Agricultural Economics.

The third line of work is a study of the world demand for cotton. This problem has been attacked by making

an analysis of the per capita consumption of cotton and cotton goods, and of that consumption in so far as possible into that which is used in clothing, in household furnishings, and in industry. This work has proceeded to the point where we are in position to give results for the leading consuming nations for a few selected years.

The other study is a cooperative project with the Cost of Marketing Division. It is devoted to a marginal analysis of the difference between the price of raw cotton and the price the consumer pays for an equivalent amount of cotton in the form of calico, gingham, sheeting, and percale. The major results of this study have been published in the form of a preliminary report. It shows that out of \$1 the consumer spent for sheeting in 1922, the cotton grower got 19.8 cents, 15.1 cents in the case of gingham, and 20.4 cents and 20.1 cents in the case of calico and percale. One of the most interesting facts brought out by the study was that the cost of distributing the cloth from the wholesaler through the retailer was almost twice as large as the amount received by the growers. These costs in 1922 were 36.5 cents for sheeting, 28.1 cents for gingham, 29.6 cents for calico, and 35 cents for percale.

### GRAIN DIVISION

H. J. BESLEY, *In Charge*

Grain Investigations, E. G. BOERNER; Milling and Baking Investigations, J. H. SHOLLENBERGER; Research Laboratory, D. A. COLEMAN; Establishment of Grades, J. H. COX; Grain Cleaning, R. H. BLACK; Bulk Handling, E. N. BATES; Grain Sorghums Investigations, B. E. ROTHGER; Rice Investigations, W. D. SMITH; Federal Grain Supervision, E. J. MURPHY and G. W. MORRISON, Washington, D. C., and R. T. MILES, general field headquarters, Chicago; chairman Board of Review, O. F. PHILLIPS; Inspection Efficiency, F. G. SMITH; Enforcement, C. L. FINCH; in charge Pacific coast headquarters, Portland, Oreg., B. W. WHITLOCK.

Close study is given to the subject of standardization in order that the Federal standards may at all times meet the needs of producers and the trade. Whenever it appears, after careful consideration and after all interests have been given an opportunity to be heard in the matter, that a change in the grades would be beneficial, such change is ordered. During the past year a number of delegations appealed to the department for certain changes in the Federal grain

standards. A number of informal conferences were held in Washington and at various points in the field, and hearings were held throughout the West at which wheat growers were given an opportunity to present any changes which they desired in the grades. As a result the Secretary of Agriculture, under date of May 17, 1924, gave public notice of a number of changes in the grain grades, all of which were to become effective August 15, 1924.

Minor changes were made in the grades for corn, wheat, and oats, which provided that grain containing live weevils or other injurious insects was to be graded in accordance with its numerical grade and that the word "Weevily" be added to and made a part of the grade designation. For example, "No. 2 Yellow Corn, Weevily." Such grain had formerly been designated "Sample Grade."

The standards for rye were changed so as to permit a tolerance of 0.1 per cent of heat-damaged kernels in grade No. 1, and 0.2 per cent of heat-damaged kernels in grade No. 2. The standards as originally promulgated permitted no heat-damaged kernels in these grades.

The definition for wheat was changed so as to exclude Polish and Poulard wheat from being classified as wheat under the standards, and the definition for "Cereal Grains" was likewise amended to include Polish and Poulard wheat.

The definition for "Treated wheat" was changed so as to require wheat to be tagged "Treated" whenever from an inspection standpoint it has been scoured, limed, sulphured, or in any other way treated so that its true quality would not be reflected by the numerical grade designation alone.

The standards for Soft Red Winter wheat were changed so as to require all wheat of this class grown west of the Rocky Mountains to be graded "Western Red." In this connection the test weight per bushel requirement for each grade of Western Red was raised 2 pounds.

A new grade for wheat of the class Hard Red Spring was established. This grade known as "No. 1 Hard Spring" is designed as a top or premium grade. It has a test weight per bushel requirement of 60 pounds and must contain at least 85 per cent dark hard and vitreous kernels. Otherwise the requirements are the same as for grade No. 1 of the subclasses of Hard Red Spring wheat.

The requirements for grades Nos. 1 and 2 of the class Hard Red Spring and Hard Red Winter wheat were changed so as to permit 5 per cent of White wheat in grade No. 1 and 10 per cent of White wheat in grade No. 2 of these classes. Prior to this change grade No. 1 permitted only 2 per cent of White wheat and grade No. 2 permitted only 5 per cent of White wheat.

Definite grades for Mixed Durum wheat were established. The requirements for Mixed Durum are 70 per cent or more of durum wheat other than the variety Red Durum and not more than 5 per cent of Soft Red Winter and White wheat whether singly or combined. The numerical grade requirements for Mixed Durum are the same as for Mixed wheat.

#### SUPERVISION AND INSPECTION METHODS

Merchandising of grain is constantly becoming more specialized and technical, which forcefully suggests the necessity for constant improvements in supervision and inspection methods and interpretations and revision of standards to meet these developments. Therefore, it is incumbent upon the bureau to broaden its research work in order to discover the facts underlying the questions and problems presented. The present outstanding research problem is in connection with the content and quality of gluten in wheat in view of the increasing importance which the trade attaches to this factor. Comparisons were made during the year of several laboratory tests used for the purpose of identifying gluten quality in wheat. It was found that gluten quality can be determined by several tests, the "viscosity test" showing the greatest promise. To go further, however, and predicate the bread-making quality from such tests is a difficult matter, inasmuch as bread making is the result of many factors of which gluten quality is only one. A report on the subject of protein and gluten as related to wheat and wheat quality was prepared and published in a mimeographed pamphlet. Tables for converting crude protein and ash content of the grain and its products to a uniform moisture base were developed and prepared for publication. These tables will be of value in providing a fairer and more uniform base for the evaluation of cereals and their products wherever protein and ash content are given consideration.

#### MILLING, BAKING, AND CHEMICAL TESTS

Milling, baking, and chemical tests are becoming more necessary to the marketing of wheat. There are no standard methods employed at present by the various agencies making such tests for the grain and flour trade, and in order to bring about improvement and uniformity in the making of these tests a description of the apparatus and of the methods used by this bureau was prepared and published. The methods and apparatus described in this bulletin are being adopted very largely by cereal chemists and experimental millers and bakers.

Over 480 milling and baking tests and over 1,200 chemical tests were made on various varieties of wheat for the Office of Cereal Investigations, Bureau of Plant Industry. The results of these tests were used by that office in connection with its work of breeding and selecting better varieties of wheat. Due to the market demand for a desirable yellow color in durum wheat, chemical tests were developed for making the color determination. This information was given to the Office of Cereal Investigations for use in developing desirable varieties of durum wheat.

#### HEAT DAMAGE DETERMINED

Physical, chemical, milling, baking, and storage studies were made to determine the intrinsic value of wheat in varying conditions of damage caused by heat fermentation. The information obtained from these investigations was used in determining the proper grading of grain under the enforcement of the grain standards act. Field studies also were made to determine the causes of heat damage. The information obtained clearly indicates that much of the wheat harvested with "combines" and of that threshed early from shocks has too high moisture content for safe storage in the farm bins as ordinarily constructed. The use of combines and early threshing reduces the costs, but a safe storage system for moist wheat is essential to complete the success of these newer methods of harvesting. Experiments were conducted to determine the extent of fermentation when damp wheat was stored in bins provided with various types of ventilators. The results obtained show that a simple and inexpensive system of ventilation for bins will prevent

heating of the grain while in storage on the farm.

### SMUTTY WHEAT SITUATION

A study was made of the smutty wheat situation in the Pacific Northwest in connection with changes requested in the wheat standards. A large number of millers and elevator men in the Pacific Northwest were interviewed and numerous samples of wheat were collected for milling and baking tests, as well as approximately 100 samples containing various amounts of smut. Microscopic examinations were made of the smutty wheat and of its flour product for smut spores. Based chiefly on the results and information obtained from these investigations, changes were made in the official standards for treated wheat.

### ADVANTAGES OF CLEAN WHEAT

Tests were made to determine the milling and baking qualities of wheat containing admixtures of eight different kinds of weed seeds of the so-called inseparable type commonly found in wheat. Charts illustrating the results were made up and distributed to some of the State agricultural officials who reported having used them to good advantage in inducing farmers to produce cleaner wheat and in educating millers regarding the importance of clean wheat. A request has been received from the extension service of the department to have a number of these charts made up and distributed to county agents for use in a campaign to improve the quality and cleanness of wheat produced and marketed.

### GRAIN-CLEANING MACHINES DEVELOPED

Two successful types of grain-cleaning machines for use at the threshing machine were perfected. One of these types, which is a portable cleaner mounted on a truck on which also are mounted a gas engine and two grain elevators, is especially designed for cleaning spring wheat and rye. This cleaner was tested at various points in North Dakota, South Dakota, and Minnesota, and it was found that it cleaned the grain as fast as threshed, and delivered the clean grain into one wagon box, wild oats into a second box, and the fine seeds into sacks. Sixteen lots of grain containing 23 to 24 per cent of dockage were cleaned to a dockage-free basis.

In addition to removing the dockage, the cleaner raised the grade of several lots by removing the excess "inseparable foreign matter." The results of these tests were entirely successful and this type of cleaner is now being manufactured and put on the market. The grain cleaned with the cleaners sold for a substantial premium over similar grain which had not been cleaned. In connection with the grain-cleaning investigations a poster entitled, "Clean Your Own Grain on the Farm" and a mimeographed report describing the operation of the portable cleaner were prepared and distributed, as well as a number of press releases and a scenario for use by the Extension Division.

### STANDARDS FOR OTHER GRAINS

During the year progress was made in the standardization of flax, barley, milled rice, rough rice, and brown rice. The grades for milled rice, published as permissive standards, effective August 1, 1923, have been adopted and are now in use by the inspection departments of a number of large associations and State departments as the basis for grading milled rice. The permissive grades for rough rice in modified form have been adopted by the California State Department of Agriculture.

Approximately 1,400 flax samples were analyzed, milled, and tested for oil content with a view to establishing official standards for flax. Due to the necessity of having a means for determining rapidly the oil content of flaxseed, a short method by which this test can be made in a few minutes was perfected to replace the old method which required 48 hours.

In compliance with the demand from the grain trade to have the official oat standards extended to include grades for "mill oats and feed oats" (oats heavily mixed with wild oats) investigations were begun during the year with a view to preparing these new grades.

Numerous other tests were made during the year, including tests for ash and crude protein in connection with the enforcement of the grain standards act. A large number of bulletins, posters, and charts have been prepared and much educational work carried on.

### GRAIN STANDARDS ACT

Very satisfactory progress was made during the year in the administration

of the grain standards act. Closer supervision of inspection was maintained and fewer violations of the regulatory provisions of the law were noted. A total of 24,905 appeals were called from inspections performed by licensed inspectors. Approximately 45 per cent of the appeals called on all grains were sustained; that is, the inspectors' grades were changed and their certificates were superseded by Federal certificates showing the correct grade. This appeal work continues to be heavy and was marked during the year by the tendency to call appeals on large shipments of cargo grain. In addition to the numerous appeals on carload lots, approximately 18,000,000 bushels of grain were appealed on vessel loadings. In the case of sustained appeals no charge is made to the appellant, but on appeals not sustained, fees are collected and covered into the Treasury as miscellaneous receipts. The sum of \$37,048.20 was covered into the Treasury during the year from this source.

#### BRANCH OFFICES

Administration of the grain standards act in the field was directed, under general supervision from Washington, by general field headquarters at Chicago and Pacific coast field headquarters, Portland, Oreg., through 6 division supervisors and 31 district offices of Federal grain supervision. District offices of Federal grain supervision are located in the following cities:

Baltimore, Md.	New Orleans, La.
Boston, Mass.	New York, N. Y.
Buffalo, N. Y.	Ogden, Utah.
Cairo, Ill.	Oklahoma City, Okla.
Chicago, Ill.	Omaha, Nebr.
Cincinnati, Ohio.	Peoria, Ill.
Denver, Colo.	Philadelphia, Pa.
Duluth, Minn.	Portland, Oreg.
Fort Worth, Tex.	San Francisco, Calif.
Galveston, Tex.	Seattle, Wash.
Indianapolis, Ind.	Sioux City, Iowa.
Kansas City, Mo.	Spokane, Wash.
Memphis, Tenn.	St. Louis, Mo.
Milwaukee, Wis.	Toledo, Ohio.
Minneapolis, Minn.	Wichita, Kans.
Nashville, Tenn.	

Branch offices were operated also at Norfolk Va., Hutchinson, Kans., Superior, Wis., and Tacoma, Wash. A representative of Federal grain supervision was stationed throughout the year at Louisville, Ky., and at St. Joseph, Mo.

#### DIVISION OF HAY, FEED, AND SEED

W. A. WHEELER, *In Charge.*

Hay Marketing Investigations and Market News Service on Grain and Hay, G. A. COLLIER; Feed Marketing Investigations and Market News Service, G. C. WHEELER; Seed Marketing Investigations and Market News Service, G. C. EDLER; Hay Standardization, E. C. PARKER; Hay Inspection Service, K. B. SEEDS; Broomcorn Marketing Investigations and News Service, G. B. ALQUIRE; Standardization of Beans and Peas, J. E. BARR.

#### TIMOTHY AND CLOVER HAY GRADES REVISED

In response to a demand from the hay interests of the eastern part of the United States the revision and simplification of the United States grades for timothy and clover was undertaken. The standardization of hay presents problems which are extremely difficult of solution. Hay can not be tested and graded in a rapid manner by any of the mechanical methods such as those available for grain. Foreign material and damaged portions can not be separated rapidly, nor can moisture and nutritive value tests be applied quickly to samples. Hay is bulky, its component parts impractical of quick separation, and its quality and relative feed value can be measured only by those characters and factors which are visible, and which are correlated with intrinsic value. Because of these facts intensive laboratory work and much consultation with producers and dealers has been necessary. A large number of bales of timothy and clover hay selected from many markets were analyzed and studied in the laboratory and simple practical methods were devised for grading the hay according to the percentage of natural green color and the percentage of foreign material content. Definitions and terms for grading hay were worked out which are definite and yet which follow the general methods well known to producers, dealers, and consumers of hay. The work resulted also in the simplification of the standards for timothy and clover hay so as to include 29 classes and grades rather than the former number of 49 classes and grades.

The results of the investigations conducted by the bureau were submitted to the public at a hearing held in Washington, D. C., January 22, 1924, at which hearing a representative

group of delegates was present from the important timothy and clover markets, country shipping points, State marketing bureaus, and the Quartermaster Corps of the United States Army. The proposed revised grades were thoroughly discussed and it was the sense of this assembly that the grades as revised were simple, practical, workable, and definite. At the close of this hearing the following resolution was introduced by a representative of the St. Louis market and unanimously adopted:

That this conference congratulates the Bureau of Agricultural Economics, United States Department of Agriculture, on the progress made in simplifying the grading of hay to a more practical basis. That it approves of the work thus far accomplished; and further, that it is the sense of this assembly that the grades as amended are adapted to the marketing of hay and that we hereby indorse them and commend them to the trade.

In response to many requests received from various hay markets, country shippers, and hay producers, a circular was prepared and published (Department Circular No. 326) in which the revised United States grades for timothy hay, clover hay, clover mixed hay, and grass mixed hay were described in popular language. Included in this circular is a short treatise on haymaking, baling and loading methods essential to the marketing of high-grade hay, which furnishes instructions to producers and shippers of hay as to the best practices to follow in producing hay to meet the requirements of the United States grades. This circular has been sent to a very large number of producers, dealers, and consumers of timothy and clover hay. Various farm papers have assisted further in giving publicity to the grades and to the treatise on hay marketing.

#### ALFALFA, WILD HAY, AND JOHNSON GRASS GRADES FOR 1925

A strong demand has been made by shippers' organizations, State marketing departments, several large terminal markets, and country shippers for alfalfa and wild-hay grades. The demand has been particularly insistent from cooperative organizations which ship alfalfa hay in quantity, from western alfalfa growers, and from western State marketing bureaus. The demand for Johnson grass grades has been very insistent also from the Southern States. The leader of this division presented general plans for alfalfa-hay standardization throughout the various

Western States, and many resolutions were passed by shippers' organizations and hay markets supporting the plans of the division and offering cooperation and assistance. It is expected that the research work can be completed on the grades for these three types of hay by February or March, 1925, at which time public hearings will be held at south-central points in the South Atlantic States, also at St. Paul, Kansas City, and other central points in the Western States.

A branch laboratory has been established at Kansas City, and cooperative laboratories at St. Paul, Minn., and Auburn, Ala., in which the work on alfalfa, wild hay, and Johnson grass grades will be carried on. Kansas City is the largest hay market in the United States and is conveniently located for securing the large number of samples required and for the training of inspectors. Cooperative work is being conducted on hay standards also with a large number of State experiment stations and other agencies.

#### HAY INSPECTION SERVICE GROWING

Although the first half of the year was devoted largely to the study and revision of the timothy and clover grades, very satisfactory progress was made in inspection work. At the beginning of the year 7 Federal hay inspectors were at work—2 in Chicago, 4 in terminal markets along the Atlantic coast, and 1 in shipping territory in central New York. Arrangements were completed early in the year whereby all hay received by members of the Chicago Hay Exchange was to be inspected under Federal supervision. As soon as definite information could be given out with regard to the changes in the grades the training of inspectors to carry on the work was resumed. The inspectors who were already in the field were called to Washington for a short course covering the revision in the grades, and a class was held at which training was given to inspectors for Cleveland, Ohio, Norfolk, Va., and Birmingham, Ala.; shipping-point inspectors for Wisconsin, Maryland, and New Jersey; a representative of the Alabama extension service; and representatives of the Quartermaster Corps of the Army. Training was given later to eight officers of the Army Veterinary School in Washington, D. C.

Arrangements were completed for another school to be held in August, 1924, at which time four additional inspectors will be trained for Wis-

consin and one each for Maine, Virginia, North Carolina, and the city of Boston. Representatives of several additional State agricultural colleges, the Canadian Department of Agriculture, and some of the large hay dealers have also indicated their intention to attend this school in order to familiarize themselves with the Federal hay grades. An inspector will also be stationed at the new laboratory in Kansas City in the near future. The hay-inspection service will then have 11 shipping-point inspectors located at 10 terminal markets.

Reports received indicate that as soon as Federal grades for alfalfa and prairie hays are issued there will be a heavy demand for inspection service at all points in the West. It is estimated that if these grades become available early in 1925 from 75 to 100 new inspectors will be trained and assisted in starting their work at points west of the Mississippi River, and 15 or 20 more inspectors will be placed in the East and South.

The Inspector's Handbook was revised this year and a new section added which contained an explanation of the methods of applying the Federal grades for hay. The handbook now is a 73-page mimeographed folder which contains under one cover all the information which an inspector ordinarily needs in the conduct of his work.

#### PREPARING GRADES FOR BEANS

A project was organized to study marketing conditions and to collect data with a view to establishing uniform standards for all classes of dry edible beans of commercial importance, as well as soy beans, cowpeas, and Canada field peas. This work was undertaken in response to repeated requests from various agencies, including State or regional commercial bean organizations, agricultural colleges, and manufacturers. Much of the preliminary work has been done and tentative grades for the various classes of dry edible beans and soy beans will be submitted to the public during the current fiscal year.

#### SEED MARKETING IN EUROPE

Many of the most important seed markets in Europe were visited by a representative of this bureau for the purpose of gaining a better insight into the production, consumption, and marketing of seeds in France, Germany, Italy, Austria, Hungary, Czechoslovakia, Poland, Denmark, Belgium,

Holland, England, and Scotland. During recent years the United States has had to import more red clover seed than it has exported, and the location of best sources of supply of seed adapted for general sowing in this country has been of great importance. On the other hand, the seed trade, including growers as well as dealers, is anxious to know where it can sell more of certain kinds of seed such as timothy, reedtop, Kentucky bluegrass, and meadow fescue. Methods of doing business, direction of movement of seeds from surplus-producing sections, preferences shown for certain qualities of seeds or seeds from certain sections, nature of complaints lodged against American seedsmen, names of most reliable seedsmen and seed growers' organizations, and methods of operation of seed-control stations were some of the other things that were studied.

The seed business is international, and information from the United States alone is not a reliable indicator of the trend of future seed prices for some kinds of seed. Seed production and demand in Europe and elsewhere may affect prices in the United States more than the size of our crop. To illustrate, the 1923 crop of red clover seed in the United States was only about half as large as the 1922 crop; nevertheless, prices in the spring of 1924 were only a little higher than during the previous year, due to the fact that Europe produced a large crop in 1923. For this reason it is highly necessary that information regarding European production and demand for seeds be made available to producers in the United States as soon as possible. In order that such information may be obtained one or more correspondents at leading markets were obtained by the representative of this bureau. These correspondents will submit monthly reports regarding seed crops and trade conditions in their countries in return for which they will receive seed reports issued by this bureau.

#### MIMEOGRAPHED REPORTS ON SEEDS

In the past only a few seed reports were mimeographed. Printed publications were depended upon almost entirely for the dissemination of seed-marketing information. It had become apparent that the printed information ordinarily does not reach the public in time to be of greatest value, so during the past fiscal year practically all of the seed reports were mimeographed and distributed immediately. These reports met with hearty indorsement by the seed trade. In

addition a number of periodic reports were published relative to production, movement, shipments, and other data.

#### NEW GRAIN-MARKET SERVICE

A grain-market news service was started in order to give farmers timely information relative to the grain-market situation and the factors causing price changes and market trends. Contacts were established with market agencies in the important grain markets east of the Rocky Mountains and reviews describing the local grain-market situation are obtained regularly each week from them. At Minneapolis, Chicago, and Kansas City the men in charge of the field offices of the Hay, Feed, and Seed Division furnish the desired reports. These weekly reviews are forwarded to Washington by telegraph each Friday night, and the information contained in them is used in the preparation of The Weekly Grain Market Review each Saturday morning. Timely foreign crop and market information and the latest official estimates of the United States grain crops are also incorporated in these reviews.

In order to give as wide distribution to these reviews as possible, the service is being introduced to daily and weekly farm papers throughout the agricultural States. On October 1, 1924, the total circulation of the weekly reviews and the monthly reviews carried by the farm journals and prepared from the same material was approximately 4,500,000. To insure the prompt publication of these weekly reviews, they are forwarded by leased wire to the branch offices at Minneapolis, Chicago, and Kansas City and mailed from them, and also from the Washington office Saturday afternoon, so as to be available for publication on Monday morning or evening in most of the papers using this service east of the Rocky Mountains. The weekly reviews are also forwarded by telegraph or mail to about 30 of the large radio-broadcasting stations in the agricultural States and are broadcast by them either on Saturday or with the early market reports on Monday. Grain-market reviews are also incorporated in the marketgram service, and weekly grain-market reports are furnished regularly for Crops and Markets.

#### MARKET NEWS SERVICE ON HAY

Greater publicity was obtained for the hay-market reviews. In addition to the reports prepared for Crops and

Markets, special weekly reviews similar to the grain-market reviews are being prepared and distributed through the farm press in the same manner as the grain reviews. They are also broadcast by a number of radio stations and are being made available to a large number of farmers and others interested in the marketing of hay. Many favorable comments have been received as to the value to the farmers of the country of the grain and hay market news service.

#### NEW FEED-MARKET SERVICE

In addition to the regular weekly reviews and prices of 13 feedstuffs at 15 important markets published in Crops and Markets, the Federal feed market reporting service was extended during the year through cooperation with various State departments of agriculture to include special reports for distribution to consumers and others interested in the marketing of feed. Cooperative arrangements have been made with Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. Special reviews, together with basic prices for the principal feeds, are furnished these States each week direct from the Washington office. Similar arrangements have been completed with the State departments of agriculture of Minnesota, Wisconsin, Iowa, and Nebraska through the efforts of the Minneapolis office of this division, which was opened during the past year. The reports broadcast by radio are a new feature and appear to be even more popular than the printed reports because of their timeliness.

#### DIVISION OF LIVESTOCK, MEATS, AND WOOL

CHARLES V. WHALIN, *In Charge*

Market News Service, J. A. BURGESS; Field Supervisor, E. W. BAKER; Livestock Market Investigations and Market Movements, C. A. BURMEISTER; Livestock Grade Standardization Committee, C. E. GIBBONS, D. J. SLATER, E. W. BAKER, and J. S. CAMPBELL; Purebred Livestock Market Investigations and Price, L. B. BURK; Meat Grade Investigations, Meat Grade Standardization, and Meat Grading Service, W. C. DAVIS; Market Research and Analysis, C. E. GIBBONS; Wool Market Investigations and Wool Standardization, G. T. WILLINGMYRE.

The market reporting service on livestock, meats, and wool made marked progress during the past fiscal year. Increased appropriations made possible the opening of five additional offices at important livestock marketing centers and the inauguration of a mar-

ket reporting service on wool. The hearty cooperation of the trade and of commercial news agencies aided materially in making available to the livestock producers more complete and dependable market information than ever before.

At the beginning of the fiscal year this division had branch offices with leased-wire connections for reporting the wholesale meat trade in Boston, New York, Philadelphia, and Chicago, and the livestock markets at Chicago, Kansas City, Omaha, East St. Louis, St. Paul, Fort Worth, and St. Joseph. In addition to the offices having leased-wire connection, the livestock market reporting offices at San Francisco and Los Angeles were in operation. The St. Joseph office was closed July 31 on account of the withdrawal of financial support by the Missouri State department of agriculture, necessitated by a reduction in the appropriation for their work.

The increase in the appropriation for the market news service, together with some financial assistance from State agencies and the exercise of strict economy in operation, made it possible to open new offices for reporting the livestock markets at Denver, Salt Lake City, Ogden, North Portland, Jersey City, and at Sixtieth Street, New York City. The Jersey City livestock market is of particular importance to producers in the Eastern and Southeastern States, and is the market center for a large number of lambs produced in Virginia, West Virginia, Kentucky, and the Eastern States. The Sixtieth Street market provides an outlet for livestock produced largely in New York State. A livestock market reporter was added to the staff of the New York office to cover both the Jersey City and the Sixtieth Street stockyards. The reports have received widespread dissemination through the columns of the metropolitan press and in addition are distributed through the press associations, telegraph companies, by radio, and other agencies in a manner similar to that in other markets in which the division is represented. The work at Atlanta was expanded to provide a complete market reporting service, and a partial service was arranged for Baltimore, Indianapolis, and St. Joseph. The extension of the bureau's leased-wire circuits to San Francisco, Fort Worth, and Atlanta made this service available to all the offices of the division except Los Angeles and Portland.

## DISSEMINATION OF INFORMATION

Careful consideration was given to the methods for improving the distribution of information in order that it might be available at the earliest possible moment to those interested. To this end the radio-broadcasting stations were utilized to the fullest possible extent, the result being that there were few if any localities in the United States where up-to-the-minute market news of dependable character could not be obtained. Contacts with the commercial news distributing agencies were broadened and strengthened. The various press associations as well as the commercial news departments of the telegraph companies requested a much greater volume of information than had ever been used previously in order to meet more adequately the needs of their members and subscribers. Trade papers representing the livestock, meats, and wool industries published an increasing amount of the bureau's market reports and have been warm supporters of the service.

The following mimeographed reports are distributed by the various branch offices:

Daily report of meat trade conditions and wholesale prices.

Daily livestock market summary.

Daily wool market report.

Weekly review of meat trade conditions.

Weekly review of livestock markets.

Weekly review of Boston wool market.

Weekly report of the Brighton livestock market.

Weekly livestock market statistics (Chicago).

Weekly livestock market statistics (St. Paul).

Special weekly livestock market reports for the press.

Monthly summary of cold-storage holdings of frozen and cured meats and frozen and mild cured fish.

Special reports prepared by the Division of Crop and Livestock Estimates on the livestock situation in producing areas.

Quarterly wool stock report.

Receipts and disposition of livestock at stockyards. (Totals and comparisons.)

It is estimated that more than 4,000,000 mimeographed reports were distributed during the fiscal year. In cooperation with the Division of Crop and Livestock Estimates many reports on production and supplies of livestock were issued through the various branch offices. These releases, supplementing this division's reports on market information, prices, and movements of livestock, meats, and wool, were invaluable as a means of furnishing information from the standpoint of both production and marketing.

**WOOL MARKET REPORTING SERVICE**

The opening of the wool market reporting office in Boston in July was one of the outstanding developments of the year. The need for Government reports on wool had been felt for some time, but it had not been possible until the past year to put this into effect on a basis comparable to the service on livestock and meats. Boston, as the most important wool-marketing center in the country, was selected as the place for the inauguration of the service, and in October the first weekly reports were released. At the request of the Associated Press, a daily service was started in February and this information is distributed to member papers over the leased wire circuits of that organization.

The weekly reviews as issued from various branch offices each Wednesday include a brief summary of the outstanding events occurring during the week, comments on domestic fleece and territory wools and foreign wool markets and price quotations. The reports on territory wools were supplemented during the shearing season in the Western States by semimonthly press releases covering prices paid to growers, selling prices of pooled clips, reports on the condition of the wools in several States, progress of shearing, condition of the lamb crop, and other pertinent information. The weekly reports issued from the Boston office contained such information as price quotations on foreign wools and the amount and trend of exports and imports. A weekly report on tops and yarns was also issued, which is of particular value to manufacturing interests and dealers. Both of these reports are sent to all parts of the country on special request in order to serve the interests of those who desire more complete information than that contained in the regular weekly reviews. A number were also sent to English and Argentine wool interests. Daily reports on trading and price quotations on certain classes and grades of domestic fleece wools are sent over the leased wire and distributed from various branch offices.

**STANDARDS FOR LIVESTOCK AND DRESSED MEATS**

Educational work was the leading feature of the standardization program for the past year. Intense interest in the subject was displayed by producers and members of the trade

and demand was made for further information. At the request of stockmen, livestock-grading demonstrations were held in California, Nevada, Utah, Arizona, and Colorado in cooperation with the Bureau of Animal Industry and the Federal and State extension services. Approximately 85 demonstrations were held at central points where herds and flocks were available and where it was convenient for stockmen to assemble and observe the actual sorting and grading of the animals. The primary object of these demonstrations was to point out to rangers the different classes and grades found in their herds conforming to the standard market classes and grades recognized by the department, and to call to their attention the differences in quality, conformation, and finish which are the factors that determine the grade and market value of an animal. No work which this division has ever attempted has been so well received or achieved such gratifying results as these grading demonstrations. Stockmen were emphatic in their indorsement, and requests have been received from other States for similar demonstrations. By pointing out to the producers the types of animals which have the greatest commercial value and the reasons therefor, it is believed that the production of better livestock will be stimulated.

**MEAT-GRADING DEMONSTRATIONS**

Meat-grading demonstrations were held for the benefit of the officials of the Army, Navy, and Marine Corps who are responsible for buying meat for their respective services. Similar demonstrations were held in Philadelphia for the benefit of the Pennsylvania State Stewards' Association. At the request of the management of one of the leading chain-restaurant companies, several meat-grading demonstrations were given for the benefit of its employees. This company has adopted the standard specifications for the purchase of meats, and all the meats used in its restaurants in New York, Boston, Philadelphia, Norfolk, and Washington are bought subject to official grading by the graders of this division.

**MEAT-GRADING SERVICE**

The meat-grading service inaugurated for the United States lines and the laid-up fleets of the Shipping Board early in 1923 was carried on with the most satisfactory results,

and, effective July 1, 1924, the service was extended to include the fleet at San Francisco. New York City is the center of the meat-grading service. Among those served are several commercial firms and State institutions, the Munson Steamship Lines, and a large general restaurant system. The meat specifications prepared by the division are in use generally where the grading service is conducted and in many public institutions. As a result of the service, substantial savings have been made in many instances and a uniform quality of production assured. One firm reported having received a refund of \$420 on a carload of dressed cows because of difference in quality, while another reported a saving of \$508 on one lot, both attributable to the meat-grading service.

Rules and regulations governing the meat-grading service under the food products inspection act have been prepared and will be printed shortly. Grade certificates and forms to be used in connection with this service have been prepared for use at all points where grading is done.

A special study involving a survey of methods and practices in selecting, grading, and handling export cuts of pork was made in 32 packing plants in this country and Canada. The results of this study were embodied in a report covering the type of hog most desired for export cuts, as well as differences in methods of handling and curing bacon for export trade. In this study differences in methods in the United States and Canada were given special attention. Tentative specifications for export cuts of pork based largely on the Canadian method were prepared and will be offered to the trade in the near future.

A special study was made to determine the relation existing between the grades of cattle and the grades of beef derived therefrom. Carlots of fat steers were graded in the stockyards by buyer, seller, and bureau representative, and all special features, both favorable and unfavorable, relating to each lot were noted and recorded. The same procedure was followed in the cooler, where the man in charge of the cooler, the head beef man, and the bureau's representative graded the carcasses and noted special features. The records of the grading of the live animals were then compared with those of the grading of the carcasses. In almost every case the deficiencies and merits of the live animal were very noticeable in the carcass.

## RESEARCH WORK PLANNED

The foundation is being laid for a constructive research program which will be of value in studying the problems of orderly marketing and the adjustment of production to demand. Both the market news service and the investigational work furnish an inexhaustible supply of statistical data. These data are compiled, summarized, and analyzed for immediate publication as current information, and later they serve as a basis for long-time studies of price trends, production, consuming demand, and market movements. They were of special value in preparing the agricultural forecasts relating to livestock and were used in making special studies of the swine situation and the statistical position of the sheep and wool industries.

## METHODS OF MARKETING LIVESTOCK

A preliminary survey was made of the beef-cattle market situation in southwest Virginia to ascertain the problems involved and the remedial measures necessary to effect improvements. The results indicated that Virginia producers were not meeting consumers' demands, and plans have been made to conduct an intensive study of the problem during the next marketing season. Methods of marketing sheep and lambs were studied briefly in connection with the lamb standardization campaign. Methods used in marketing the California spring lamb crop were given careful attention and assistance was rendered to California producers in marketing their lambs. A survey of marketing problems of the western stockmen was made in connection with the livestock-grading demonstrations held in the range States. A number of other studies were carried on and recommendations made wherever it was found that improvements might be effected.

## LAMB-IMPROVEMENT CAMPAIGN

Gratifying progress was made in the campaign to improve and standardize the quality of eastern lambs and bring about more orderly marketing of the product. The work was carried on in cooperation with the agricultural extension service of Virginia, West Virginia, and Tennessee, and with a committee representing the trading interests of the Jersey City market. Demonstrations were conducted by extension workers to show

producers how the quality of lambs could be improved by using better breeding stock, following improved methods of sheep husbandry, and docking and castrating ram lambs. Selected shipments of lambs were followed through the market by this division and complete information obtained regarding grade, selling price, carcass yield, and other factors which would show the relative value of various grades of lambs. This information was forwarded to the shippers and extension workers, thereby permitting them to see the market's actual appraisal of lambs of different quality. Expressions from the sheep producers indicate that a large part of the lamb crop of 1925 will be standardized and the number of bucky lambs materially reduced. One of the most constructive achievements of this campaign was that of getting the trade interests of Jersey City to give more attention to sorting lambs and buying them according to grade. At a conference held in New York City on June 20, 1924, resolutions were adopted by buyers and sellers to the effect that in the future lambs would be sorted and sold according to their respective merits. In carrying out these resolutions, the trade makes it possible for producers to learn just what the market demands and how it discriminates against inferior quality.

#### OFFICIAL WOOL STANDARDS

The wool grade standards developed in this bureau were made the official standards of the United States effective July 1, 1923. Shortly thereafter distribution of sets of samples representing these standards was begun. The establishments to be supplied first were the warehouses licensed under the United States warehouse act which are compelled to employ the standards when grading wool stored with them. Other agencies and institutions, including wool dealers and manufacturers, wool growers and growers associations, and educational institutions, have been supplied with sets as rapidly as practical forms could be prepared.

#### INTERNATIONAL WOOL STANDARDS PROPOSED

Early in the fiscal year a wool-marketing specialist was sent to England to confer with the British wool authorities relative to wool standardization and the possibility of effecting a correlation between the British and the United States wool grades. Such a correlation seemed particu-

larly advisable because much of the wool imported into the United States comes in under the British classification and much of the trading here is done on the basis of these grades. Furthermore, the British classification is not uniformly interpreted on both sides of the Atlantic. There being no British official wool standards, leading representatives of the industry were requested to furnish samples which would represent the British commercial grades. A committee representing the British Wool Federation was designated to review the grades and make determinations of the average Bradford qualities as regards diameter of fiber. In order to establish complete correlation, it was found necessary to make changes in both the United States and the British classifications. Through a reduction in the range of several of the grades, the grades of the United States standards were increased to 12 and the spread of the Bradford grades reduced so as to make the sets correspond in numbers. Representatives of the Bureau of Standards and the Associated Textile Manufacturers assisted with the correlations. Three master sets of the correlated samples were prepared, one of which was shipped to England and the others retained by this department and by the Bureau of Standards.

#### MOHAIR STANDARDIZATION WORK

Further investigations in connection with the development of mohair grade standards were conducted in Texas and Oregon during the year. Early in the fiscal year the Southwest Farm Bureau Wool and Mohair Association of Texas employed a grader recommended by this bureau, who graded the mohair assembled by it in accordance with the proposed grades. While the quantity of hair graded was small, the returns from the graded lots indicated that the grades were satisfactory.

#### DIVISION OF DAIRY AND POULTRY PRODUCTS

ROY C. POTTS, *In Charge.*

Dairy Products Investigations, D. L. JAMES; Poultry Products Investigations, J. M. BORDERS and R. R. SLOCUM; Market News Service, L. M. DAVIS; and Dairy Inspection Service, C. W. FRYHOFFER.

The market news service was improved during the year and new activities were added. A growing interest on the part of the trade in market

statistics was evident on every hand, and effort was made to meet trade demands along this particular line in so far as possible. Not only were sources of information watched closely for the purpose of insuring completeness and accuracy, but closer contacts were established. The price reporting service of the bureau is used by many creameries and country shippers in checking market returns, and it is found that there is a growing use of these prices as a basis for actual sales and purchases. Statistics prepared in Washington and at branch offices are now generally accepted and are widely used. With the exception of Boston, the wholesale dairy exchanges in markets where offices of this division are located have discontinued their own statistical organization and are now using as their official statistics those furnished by this bureau. Attention will now be given to making these statistics of greater use to the trade and the industry as a whole through systematic statistical studies, which will result in a better interpretation of market conditions.

#### NEW STORAGE REPORTS

Following requests made by the National Poultry, Butter, and Egg Association, and others, reporting of the daily and weekly cold-storage movement of butter, cheese, eggs, and dressed poultry in an additional number of cities was successfully undertaken during the year. The daily report now includes 10 important markets and in addition a weekly report includes 17 other cities. Daily releases which indicate cold-storage holdings on hand the morning of the current day, and weekly releases each Monday, which report holdings as of Saturday morning, are issued at branch offices of the division. The weekly report is particularly valuable in that it affords frequent information as to stocks in plants containing from 60 to 75 per cent of the total storage holdings of dairy and poultry products in the United States, thus making the report indicative of the total storage movement.

#### LIVE POULTRY REPORTS

Arrangements were made during the year to secure daily reports of arrivals of live poultry at New York City by freight and express and also a report of cars on track each morning, old arrivals and new arrivals being reported separately. This work was undertaken on request from the New

York poultry trade for more complete information. New York City is the largest and most important market in the United States for live poultry, depending largely for its supply upon the Middle Western and Southern States. The necessity for handling live poultry promptly makes complete and accurate information an essential to both shippers and receivers. This information helps also to prevent unwarranted price fluctuations.

#### TURKEY MARKET REPORTS

During the period from the middle of November until the close of the Christmas holidays a turkey market report was issued from the eastern branch offices and from Washington. This report contained information regarding supply, demand, and prices at distributing markets and at the principal turkey-shipping points in Texas. The turkey crop in Texas constitutes one of the principal sources of supply for eastern markets, and this shipping-point information was recognized as being of particular value by wholesale dealers and others in the city markets. Prompt information from the markets resulted also in a better understanding on the part of the shippers in the country.

#### PERMANENT BRANCH OFFICES

Permanent offices of the division are located at New York City, Chicago, Philadelphia, Boston, Fond du Lac, (Wis.), Minneapolis, and San Francisco. These are all reporting offices except Minneapolis, which is devoted chiefly to serving mailing lists in the important dairy sections of Minnesota and neighboring States. The extension of leased-wire service to San Francisco during the year placed the San Francisco office in closer daily communication with eastern markets. With the continued development of the Pacific coast as an important source of supply for butter and eggs, interchange of this information contributes to the needs of the trade in the East as well as on the Pacific coast.

#### ADDITIONAL SERVICE REQUESTED

Requests were received for the establishment of new reporting offices at Baltimore and Los Angeles, and plans were developed for partially meeting the need for information at these points. These plans contemplate the establishment of statistical services to report on supplies reaching these markets. The Baltimore Butter

and Egg Exchange and the State Department of Agriculture in California have cooperated in working out an arrangement which it is expected will be satisfactory until a more extensive program to meet the full needs of the local markets can be provided. The Pacific States Butter, Egg, Cheese, and Poultry Association has indicated a desire for the establishment of offices at Portland, Oreg., and Seattle, Wash.

Numerous requests for price reports on eggs and poultry continued to reach the bureau during the year, but the existing branch office organization could not handle such work. It seemed inadvisable also to undertake reporting prices until uniform grades had been established. Work in connection with the tentative United States egg grades points to the adoption of uniform grades, and when this is accomplished the reporting of egg prices can be undertaken on a satisfactory basis.

#### BUTTER-INSPECTION SERVICE

The outstanding development in the butter-inspection service during the year was the drawing up of a cooperative agreement with the Philadelphia Produce Exchange providing for a joint inspection service. Under the agreement the authorized butter inspector of the department became the official inspector for the exchange. Arrangements were made also with Minnesota for a joint Federal-State butter-inspection service. In Minnesota the work will consist almost entirely of inspection of butter concentrated for shipment to distributing markets, while at Philadelphia the inspections are made after arrival.

Butter-inspection service continued to be maintained at the following markets during the year: New York, Chicago, Philadelphia, Boston, San Francisco, and Washington. There was a slight increase in the amount of inspection work done for shippers and receivers, although the largest increase consisted of inspections made for large users of butter such as Government departments, State and city governments, institutions, restaurant companies, steamship lines, etc., which purchase butter on contract specifications.

Changes in personnel and the small force available are partly responsible for such a small increase in the commercial inspections. Resignations made new appointments necessary, and the assignment of both inspection and market-news service work to some men made it impossible for the inspec-

tion service to be satisfactorily handled at all times. The wholesale trade is particularly displeased when changes in inspectors are made, and on each new assignment the inspector must win the confidence of the trade as to his own ability. The reason for this is obvious when it is recognized that the inspection of butter is very largely a matter of personal judgment, depending on the inspector's sense of taste and smell.

#### *Summary of inspections made during the year*

Market	Commercial inspections	Government inspections	Total inspections
New York.....	1,562	442	2,004
Chicago.....	1,569	10	1,579
Philadelphia.....	2,237	360	2,597
Boston.....	447	173	620
San Francisco.....	115	292	407
Washington.....	18	109	127
Total.....	5,948	1,386	7,334

#### DAIRY-PRODUCTS STATISTICS

An important feature of the work of this division is the preparation of the report on production of manufactured dairy products in the United States. The list of manufacturers from whom information is obtained now approximates 10,000 names. Special effort was made during the year to make the report more fully represent the total production of the United States through a more persistent follow up of negligent firms and to push forward the time of releasing the report. Cooperation of various State officials has been secured, and further negotiations are under way which should bring favorable results. From the standpoint of the industry, the desirability of a uniform plan of compiling dairy-products statistics as to periods covered, commodities included, etc., is obvious.

#### TENTATIVE EGG GRADES

The past year witnessed a marked advance in the egg-standardization program. During that time United States grades for eggs were issued in tentative form as a basis for discussion and criticism by all branches of the egg industry. Work was done and is being continued in examining commercial shipments and grades of eggs and in reporting their quality in terms of United States grades. Commercial grades are studied in connection with the United States grades for the pur-

pose of detecting weakness in the Federal grades and in order that any modifications which seem desirable may be made.

Following two conferences with members of this bureau in 1924 representatives of the egg trade put themselves on record as approving the general principle of uniform standards for eggs and agreed to cooperate with the department in the establishment of such standards and grades as would prove satisfactory and practical. A committee representing the different interests in the egg industry is to be appointed by the National Poultry, Butter, and Egg Association to assist the department in putting these grades into final form. It is expected that the committee will meet this fall and that soon thereafter the United States grades will be published in final form. A handbook covering in detail the inspection of eggs has been prepared, but its issuance is being deferred pending the issuance of the Federal standards.

Educational work has been done in acquainting the trade and producers with the proposed egg standards. A representative of this division attended the spring meetings of a number of the State associations of egg shippers in the Middle West, explained the grades, and demonstrated them to the members. In addition assistance was offered the various States through their extension services in promoting a standardization program, and up to July 1 such assistance was rendered in West Virginia, Missouri, Indiana, and Vermont. A large number of other States have requested similar aid, which will be extended them during the present fiscal year.

#### BUYING ON QUALITY BASIS

To secure for producers the full benefit of egg standardization, it is essential that eggs be bought from producers on a quality basis so that producers of eggs of higher grades shall receive a better price than producers of eggs of lower grades. A great deal of effort was directed, therefore, to a campaign to encourage the marketing of eggs on a quality basis. This was carried on through the extension services of the different States and in cooperation with State egg-shipper associations, and with individual buyers and shippers. To further this work four mimeographed circulars were issued in the form of letters addressed to egg producers,

country buyers, carlot shippers, and county agents. Grades also have been issued which are combinations of the United States grades, for use in buying eggs from producers at country points where it may not always be feasible to employ the full range of United States grades. A mimeographed circular was issued which called attention of producers to the points which should be given consideration in order to produce eggs of high quality.

#### EGG-INSPECTION SERVICE

A striking evidence of progress in egg standardization was the inauguration early this summer of an egg-inspection service on the New York and Chicago markets. At New York the time of an egg inspector has been almost entirely occupied in making contract inspections of eggs for the Navy, various shipping lines, Government hospitals, and for a chain of restaurants. In June inspections of this character covered nearly 5,000 cases of eggs. Experimental inspection of commercial grades of eggs in terms of United States grades have also been made by the inspectors as time permitted.

#### COOPERATIVE EGG MARKETING

Assistance was given to the Virginia Poultry Producers' Association in establishing field grading work and in training graders in candling eggs and in the recognition of egg quality. Assistance was given to the Missouri Farmers' Association in handling egg-grading problems by checking up on the work of the candlers and by demonstrating the United States grades for eggs.

During the spring assistance was given the New Jersey bureau of markets in working out grades for eggs and the establishment of a plan whereby eggs candled and graded by an authorized inspector of that bureau could be sold under a State seal which serves as a certificate of the quality of the eggs. Representatives of this division went to New Jersey to assist in training egg inspectors to grade the eggs marketed by the authorized breeders' association of that State.

In addition to these activities the division furnished assistance in Virginia, Alabama, Ohio, Illinois, and Missouri, where cooperative marketing agencies were being organized or where organization was being contemplated.

## COOPERATIVE DAIRY MARKETING

The growing interest of farmers in cooperative marketing as a means of improving marketing conditions and of increasing their net return has been especially manifest among producers of dairy and poultry products. Many calls for assistance of the department have been answered and many groups of farmers have been helped in working out plans of organization, including financing and methods of operation.

The problems of marketing dairy products by producers vary in different sections. Near large cities the problem is primarily one of marketing milk to city distributors, and in some instances of undertaking city distribution through a producers' cooperative milk distributing plant. In butter-producing territory and in cheese-manufacturing districts, where the farmers' milk and cream are manufactured into cheese or butter in cooperative factories, the problem of marketing is largely that of selling the manufactured products through associations or federations of cooperative creameries or cheese factories. On these various problems of marketing dairy products cooperatively, representatives of the department have been able to render much valuable assistance in determining the type of organization best suited to meet the conditions in the various sections.

## NEW PUBLICATIONS ISSUED

During the year definite progress was made in the preparation of publications, and a number of mimeographed circulars as well as bulletins have been prepared. There has also been prepared material on marketing poultry products, which is to appear in the 1924 Yearbook. During the fall a trip was made through the Middle West to secure material needed in the preparation of a bulletin on the construction, operation, and equipment of poultry and egg-packing houses. The work of gathering material for a handbook of poultry statistics has reached virtual completion, and the handbook of dairy statistics has been revised. Gathering of information for the issuance of a bulletin in cooperation with the Bureau of Animal Industry on marketing baby chicks has been nearly completed.

## DIVISION OF FRUITS AND VEGETABLES

WELLS A. SHERMAN, *in Charge*

Market News Service, EDWIN W. STILLWELL; Inspection Service, F. G. ROBB; Grades and Standards, H. W. SAMSON; Standard Containers, H. A. SPILMAN; Research Studies, H. W. SAMSON.

A substantial and much-needed expansion of the market news service was possible during the past year through an increase of appropriation for this work. On July 1, 1923, the leased-wire telegraphic service of the bureau was extended from Kansas City to San Francisco, and on September 1 the wire was extended to Atlanta and Jacksonville. This extension made it possible to open five additional market stations, viz, Atlanta, Denver, Salt Lake City, San Francisco, and Portland. Permanent branch offices are now located in the following cities, all but two of which are connected with Washington by the leased-wire system, these stations being Los Angeles and Portland, which are reached by commercial wires and radio: Atlanta, Ga.; Baltimore, Md.; Boston, Mass.; Chicago, Ill.; Cincinnati, Ohio; Denver, Colo.; Fort Worth, Tex.; Kansas City, Mo.; Los Angeles, Calif.; Minneapolis, Minn.; New York, N. Y.; Philadelphia, Pa.; Pittsburgh, Pa.; Portland, Oreg.; St. Louis, Mo.; Salt Lake City, Utah; San Francisco, Calif. In addition the leased wire reaches the following cities where the service is maintained by State offices: Harrisburg, Pa.; Richmond, Va.; Raleigh, N. C.; Columbus, Ohio; Stevens Point, Wis.; Jefferson, Mo.

Temporary field stations in 36 important producing sections issued reports in season on apples, cabbage, cantaloupes, celery, grapes, lettuce, onions, peaches, pears, plums and prunes, potatoes, strawberries, tomatoes, and watermelons. Leased-wire service reached two of these field stations—Waupaca, Wis., and Sacramento, Calif. New temporary offices were opened during the year at Orlando, Fla., Raleigh, N. C., Mobile, Ala., Grand Forks, N. Dak., Grand Junction, Colo., and Sacramento, Calif. In all the news service had its representatives in 30 different States.

## ADDITIONAL PRODUCTS REPORTED

The daily telegraphic reports of shipments were increased to include 14 additional products, the following

being a complete list, those followed by an asterisk having begun during the past year:

Apples, asparagus,\* cabbage, cantaloupes, casabas, cauliflower, celery, cherries,\* cucumbers,\* eggplant,\* grapefruit,\* grapes, honey dews, lemons\*, lettuce, mixed citrus fruit,\* mixed deciduous fruit, mixed vegetables, onions, oranges,\* peaches, pears, peppers,\* potatoes, plums and prunes,\* romaine,\* Satsumas,\* spinach, strawberries, string beans,\* sweet potatoes, tangerines,\* tomatoes, and watermelons.

Complete reports were issued in season on 20 of these products. Daily-shipment information was released on the other 14 minor products. The monthly mail reports received from local freight and express agents throughout the country include all of the above-mentioned fruits and vegetables and in addition the following commodities: Carrots, cranberries, dried apples, dried peaches, dried prunes, dry beans, rutabagas, and turnips. These mail reports show the car-lot movement from each shipping station.

#### CAR-LOT SHIPMENT REPORTS

The largest number of car-lot shipments ever reported in one year was the record attained last year when approximately 921,000 cars of these various fruits and vegetables were listed. This is a gain of about 55,000 cars over the highest previous record. The total number of mimeographed reports issued at market stations was about 6,068,000 and those published at temporary field offices about 2,516,000, making a grand total of 8,584,000 reports, or an increase of 1,063,000 over the preceding year. Mailing lists at market stations and Washington included 38,735 names and field-station lists totaled 28,835. Distribution of market reports was made also by radio, telephone, and telegraph (collect), and through the press. The weekly bulletins on peanuts continued to be issued from Washington to a mailing list of about 1,000 and the semi-monthly market reports on honey and beeswax continued to meet with favor among a large number of beekeepers and dealers in honey. The weekly market review, the weekly summary of carlot shipments, and the monthly market review reached a limited number of persons interested in this type of information, but the data contained are given wide dissemination through the press and by radio. Special telegraphic summaries are furnished collect to a few papers. The daily radiophone reports and the weekly marketgrams were continued

with good effect and much material on fruits and vegetables was published in Crops and Markets.

#### UNLOAD REPORTS

The number of products covered by the unload reports regularly obtained by division representatives in 21 city markets was increased from 10 to 16 by the addition of grapes, grapefruit, lemons, oranges, watermelons, and lettuce. Railroad agents in 14 other cities also supply this information, thus making the unload data cover 16 leading fruits and vegetables in 35 cities. These statistics are becoming more complete and more valuable each year. There has been a great demand for special tabulations of unloads and for the mimeographed sheets or summaries that have been prepared. The information is released in many ways by branch offices, is used in field station summaries, and enters into the preparation of publications of importance in the field of economics. The unload reports not only show the sources of supply in these 35 markets but also indicate the consuming capacity of each city for these particular fruits and vegetables.

#### STATE AND BUREAU COOPERATION

By the extension of the leased-wire system to the capitals or other central points in Virginia, North Carolina, and Florida it was possible to inaugurate cooperative market news work in those sections in addition to the six States already enjoying this arrangement. Cooperative market reports were also issued in Georgia, South Carolina, Michigan, Colorado, Utah, California, and Alabama. State agencies and local growers and shippers assisted financially in the operation of two-thirds of the temporary field stations of the news service. Some of the States, notably New York and Texas, took the initiative in rendering a news service on a cooperative basis so as to give the greatest possible aid to farmers and distributors in their respective territories. New York grapes and lettuce, Texas spinach, cabbage, and other crops were covered in this manner.

#### SHIPPING POINT INSPECTION SERVICE

The shipping point inspection work has almost doubled during the past year, 130,959 cars of fruits and vegetables having been inspected at shipping point during the fiscal year, as compared with 72,466 inspected during the previous year.

The following table shows the number of cooperative shipping-point inspections made in the States listed during the last two years:

State	1923	1924
Alabama.....		251
Arkansas.....		88
California.....	17, 778	46, 424
Colorado.....	24, 815	10, 841
Delaware.....		50
Florida.....	162	8, 370
Georgia.....	45	1, 392
Idaho.....	13, 338	18, 403
Illinois.....		208
Louisiana.....		266
Maine.....	384	
Massachusetts.....	67	7
Mississippi.....		1, 709
Missouri.....	36	
Montana.....	444	305
Nebraska.....		4, 830
Nevada.....		34
New Jersey.....	1, 499	719
New York.....	905	1, 475
North Carolina.....		566
North Dakota.....	432	
Ohio.....	78	169
Oregon.....	387	4, 442
Pennsylvania.....		274
South Carolina.....	1, 091	1, 712
South Dakota.....	308	368
Tennessee.....	51	232
Texas.....		6, 349
Utah.....	651	1, 642
Virginia.....	4	526
Washington.....	8, 917	15, 360
West Virginia.....	39	232
Wisconsin.....	1, 035	2, 305
Total.....	72, 466	129, 049
Arizona <sup>1</sup> .....		300
Indiana <sup>1</sup> .....		551
Kansas <sup>1</sup> .....		855
Missouri <sup>1</sup> .....		204
Grand total.....	72, 466	130, 959

<sup>1</sup> Straight Federal inspection at shipping points.

Of the total of 130,959 cars inspected at shipping points, 239 reinspections were made at receiving markets and in 110 cases the findings of the original inspector were changed.

This indicates that during the past year one car out of 1,190 was reversed, while during the previous year only one out of 2,131 was reversed. The increase in number of reinspections made and cars reversed is due largely to greater familiarity on the part of the trade with established grades and with the methods of the inspection service. The total number of reinspections has been small considering the total volume of work performed, and the policy followed by the bureau has served to inspire more confidence in the service on the part of receivers.

All reinspections are called to the attention of the supervisor of the district in which the original inspection was made and careful investigation of the work of the inspector follows. In

a number of instances such inspectors have been discharged as a result of such investigations.

The second year of shipping-point inspection service has demonstrated that more progress can be made in securing the adoption of recognized standards at shipping point through inspection service in a single season than can be accomplished in a number of years by any other means. Without exception supervising inspectors have reported marked changes in grading practices in every section where shipping-point inspection service has been used a second season. A constant increase in demand by receivers for inspected products speaks loudly of the benefits being derived by the trade from this service. Insistence by several organizations on the shipment of graded products only, has kept on the farms a considerable volume of low-quality products which otherwise would have gone on the market in competition with the higher quality offered by the better growers and shippers.

Cooperative organizations have been greatly benefited by the inspection service because of the assistance it has rendered them in dealing fairly with their members without the embarrassment usually experienced by officers of these organizations in obtaining deliveries of uniform quality from their members.

The use of the shipping-point inspection service by f. o. b. auctions has not increased as was expected a year ago. One auction company has ceased business on account of inability to secure a sufficient number of cars for sale to justify the enormous expense of maintaining the leased wires between the principal markets in which the auction offers cars for sale. The second auction company has not shown an appreciable increase over last year's work.

#### TERMINAL MARKET INSPECTIONS

Inspectors were maintained in 25 of the principal receiving markets of the country and inspections were made at a total of 328 points. Inspections are made at points which can be conveniently reached from the markets at which inspectors are stationed when the applicant pays the traveling expenses incident to such service.

A total of 29,283 inspections were made at receiving points during the year which is an increase of 1,114 cars over the preceding year. It was found

necessary to decline over 2,000 inspections because of lack of time. The following table shows the number of inspections at receiving points by months:

*Terminal Inspections by Months For Fiscal Year 1924*

	Inspections total	Total carlots	Total Less than carlots	Declined for lack of time	Carrier inspections
July.....	2,194	2,040	154	646	753
August.....	1,388	1,324	64	429	418
September.....	1,548	1,460	88	341	296
October.....	2,890	2,759	140	109	565
November.....	2,570	2,364	206	169	266
December.....	1,788	1,620	168	9	245
January.....	2,750	2,422	328	24	580
February.....	2,795	2,447	348	23	556
March.....	2,687	2,423	264	37	387
April.....	2,737	2,002	735	25	891
May.....	2,804	2,618	186	142	1,181
June.....	3,123	2,915	208	193	1,493
Total.....	29,283	26,394	2,889	2,147	7,661

Total inspections for carriers: 1921-22, 12,105 cars; 1922-23, 8,524 cars; 1923-24, 7,661 cars.

In addition, inspections were made for the Navy, Marine Corps, and Shipping Board amounting to 39,751,625 pounds of produce, as compared with 37,632,581 pounds for the preceding year. In addition, 4,895,003 pounds were inspected for the United States Lines and large quantities for the Munson Line, and for the laid-up fleet. Very substantial savings were effected for the Federal Government by these agencies through rejections of products which were below grade on the basis of the Federal inspection certificate.

#### PROGRESS IN STANDARDIZATION

One of the most important aids to the orderly marketing of farm products is the use of uniform standards. The rapid extension of the shipping-point inspection service has made it necessary to expedite the work of formulating Federal standards, since well understood and acceptable standards are essential to the success of the inspection service. During the year grades were recommended for 12 additional products and for 7 other products the grades were revised. The following is a complete list of the fruits and vegetables for which Federal grades have been formulated, those marked with an asterisk having

been either issued or revised during the last year:

Barreled apples, \*beets, asparagus, cabbage, \*cantaloupes, \*carrots, \*cauliflower, celery, \*citrus fruits, cucumbers, \*table grapes (California), \*juice grapes (California), lettuce, \*Bermuda onions, Northern-grown onions, \*peaches, \*shelled white Spanish peanuts, \*farmers' stock peanuts, \*pears, \*sweet peppers, \*plums and prunes, \*pineapples, potatoes, \*string beans, sweet potatoes, strawberries, \*turnips, \*cannery tomatoes, tomatoes, \*watermelons.

In addition to these standardization studies, extensive investigations have been made with a view to revising grades for celery and northern-grown onions. Careful study has been made also of the grading of canning tomatoes and citrus fruits. The citrus fruit studies were confined to Florida and had particularly in view the more exact definition of terms. One of the outstanding accomplishments of the season in standardization was the use of the United States peach grades in Georgia. These grades were adopted by the Georgia Peach Growers' Exchange and served as a basis for the inspection of more than 10,000 cars. This is the first year that Georgia has used any recognized standard and the services of a standardization specialist were made available in order to bring about uniformity of interpretation by the various supervising inspectors in charge. The use of the United States grades for Bermuda onions was also extended to Texas for the first time since 1915 and the grades as revised were found to be thoroughly practical.

#### REJECTION OF SHIPMENTS

A serious problem in the marketing of fruits and vegetables is the rejection of shipments purchased at point of origin by buyers in distant city markets. A study has been made of the causes of such rejections of shipments of northwestern boxed apples in the receiving markets. This study covered 10,777 carloads shipped from 15 important dealers in the State of Washington. Many shippers contend that rejections of their shipments occur almost invariably during market slumps, and that during such periods receivers refuse their purchases merely to avoid losses, while on the other hand receivers claim that rejections are the result of the failure of the shippers to comply with the terms of sale. Although a study of but one year does not warrant absolute conclusions, it was shown that approxi-

mately 80 per cent of the rejections during this year were on the ground of poor condition, and that the rejections increased as the season advanced and the fruit became riper. It did not appear that there is any definite relation between the number of rejections and the trend of f. o. b. prices. It was shown clearly that a large number of rejections might be avoided by making the terms of sale more definite and specific; and if shippers took the trouble to secure legal confirmation of sales, redress could be secured by them more often. It has been clearly demonstrated that the practice of buying on a Government shipping-point inspection certificate is of great advantage to both parties, as this certificate states definitely the variety, grade, size, maturity, and general condition of the fruit as well as the condition of the car and equipment. Thus the buyer is informed as to exactly what type of shipment he will receive, and little chance is left for misunderstanding at time of delivery.

At the request of the Federal Farm Loan Board a study was made and a report submitted on the marketing of Maine potatoes. The purpose of this study was to determine the suitability of potato warehouse receipts as collateral for loans.

An interesting study was made and a report prepared on the business methods of the Bolton products stores in Philadelphia. This is a new type of enterprise in the nature of a chain-store system which handles fruits and vegetables only on a self-service basis. This type of enterprise was found to be popular with the public and a financial success.

#### ACTIVITY OF AUCTION COMPANIES

Although auction companies have been in existence for a long period, the first comprehensive report covering their functions and methods has just been completed. It was found that auction companies, while handling a large number of commodities, were concerned chiefly with fruits, both citrus and deciduous. The business of the auction companies in handling well-standardized products has grown rapidly. This increase may be largely attributed to the patronage of large cooperative as well as large private marketing agencies, who find in the auction a quick method of disposing of their produce for a cash return.

#### RESEARCH WORK PUBLICITY

A number of other very important studies have been carried on during the year, including an analysis of the distribution of citrus fruits from both California and Florida; a compilation of shipments by commodities and States; unloads of specific commodities in large receiving markets; and carlot shipments of fruits and vegetables by commodities and shipping point. A number of bulletins have been prepared and wide publicity has been given to this information through press releases and the department's publications. The type of research work is being stressed at the present time which will give practical assistance to producers and marketing agencies in avoiding the heavy losses which have been attendant upon the fruit and vegetable trade through faulty methods of handling and shipping, and through the shipping of ungraded stocks which are not marketable and which entail heavy freight charges as well as losses from the cost of handling.

#### STANDARD CONTAINERS

Manufacturers of containers are manifesting an increased tendency to submit samples of their output to the bureau for testing in order to secure compliance with the law and to seek the advice of this bureau with regard to specifications for containers which they intend to manufacture. The work of testing containers has steadily increased. During the fiscal year 4,546 samples were tested as compared with 3,613 in 1923. The proportion of samples which meet the specifications of the bureau has also increased materially. A representative of this bureau visited 53 container factories in 12 States in the course of a year and made addresses at the conventions of the National Basket and Fruit Package Manufacturers' Association as well as at meetings of a number of similar organizations. The program of this bureau was indorsed by a number of bureaus and horticultural societies. In addition to enforcing the provisions of the standard container act a great deal of work has been done in connection with standards which have not yet been fixed by law.

#### COLLECTION AND DISTRIBUTION 1918 EXCESS-WOOL PROFITS

WELLS A. SHERMAN, *In Charge*; W. L. EVANS, *Assistant*

Wool growers have thus far received refunds aggregating \$444,574.93 from

the excess profits collected by this department from dealers who handled the 1918 wool clip under the Government regulations which fixed the price of wool and limited the profits which might be made. This work of collecting and distributing excess wool profits was transferred from the War Industries Board to the Department of Agriculture by Executive order dated December 31, 1918. Since that time Congress has made annual appropriations to complete this work. Incidentally, this effort to keep faith with the growers is proving profitable to the Government, for offsetting the \$103,595 expended since December 31, 1918, from appropriations made by Congress, it is already known that \$200,000 of the money collected will remain undistributable through the impossibility of locating the growers, making a net gain to the Government up to this time of nearly \$100,000.

Total excess profits of \$1,484,207.99 were found to have been made on the 1918 season's wool operations. Of this amount \$748,829.22 has been collected, the balance of practically an equivalent amount being due from only 58 dealers. Many of these dealers are resisting payment, making suits in Federal courts necessary. Ninety per cent of the \$750,000 awaiting collection is payable by 12 dealers. The efforts of this department are directed particularly at this time toward expediting and assisting in the trials of pending cases. All cases thus far reached for argument or for trial have been decided in favor of the Government.

#### ADMINISTRATION OF THE UNITED STATE WAREHOUSE ACT

H. S. YOHE, *In Charge*

Grain Warehousing, H. K. HOLMAN, Jr.; Wool Warehousing, C. NAGEL; Tobacco Warehousing and Standardization, F. B. WILKINSON; Fruit and Vegetable Warehousing, PAUL M. WILLIAMS; Cotton and Broom-corn Warehousing, under direct supervision of division leader.

Prior to February 23, 1923, the warehouse act was confined to cotton, grain, wool, and tobacco. On that date the act was amended so as to give the Secretary of Agriculture authority to place any agricultural product which he considered properly warehouseable under the provisions of the law. In the past year investigations preliminary to drafting regulations for the storage of peanuts, potatoes, broom corn, beans, nuts, hay, dried and canned fruits, apples, and cane sirup were undertaken. Regulations for the

storage of peanuts were promulgated on September 29, 1923; for the storage of the late crop of potatoes on May 10, 1924; and for broom corn on May 16, 1924. Regulations for the storage of dry edible beans have been drafted and will be submitted for promulgation in time to take care of the coming season's crop.

#### LICENSED WAREHOUSE RECEIPTS

One of the main purposes of the warehouse act is to furnish a form of warehouse receipt which will be of distinct aid to the grower in the orderly marketing of his crops. Such a receipt must be acceptable to the bankers generally for loan purposes. Eleven of the thirteen cotton growers' associations which are functioning on a state-wide basis are now using the Federal warehouse receipt for financing purposes. Individual growers who are not members of the associations are also using it. That it is serving them is evidenced by a report submitted by a planter to this department indicating that some time ago he took about 1,200 warehouse receipts to a bank to secure a loan. The banker accepted all the receipts which were issued by federally licensed warehouses, but refused to lend on those issued by nonlicensed warehouses.

Many letters and reports are received from farmers, bankers, and others which clearly indicate that the warehouse act has been of real service. From the northwestern grain-growing section a letter was received recently which reads in part as follows:

You no doubt are aware that there have been quite a number of bank failures in the Northwest this year and this would naturally cause a drain on the more solid banks, but at that we experienced absolutely no trouble in financing our collateral and we are satisfied that this was due to the fact that our warehouses were all bonded under the Federal warehouse act and the grain storage was under the supervision of your department.

The rice growers' cooperative associations of Louisiana, Arkansas, and California all store their rice in federally licensed warehouses in order that they may arrange to secure funds necessary to finance their operation by use of the Federal warehouse receipts.

A great many bankers have indicated in no uncertain terms their approval of the Federal warehouse receipt. This receipt is making for larger loans on agricultural products and at the same time at lower rates of interest. The Washington State Bankers' Association at its annual

meeting last June adopted a resolution strongly indorsing the Federal warehouse act.

The action taken by the board of directors of the Federal Reserve Bank of St. Louis as a result of the cooperation between that bank and this department will have a far-reaching influence. A resolution adopted by that board reads as follows:

*Resolved*, That after September 1, 1924, the Federal Reserve Bank of St. Louis and its branches will not accept as collateral warehouse receipts for agricultural products as covered under the United States warehouse act unless such receipts are issued by a warehouse duly licensed under that act.

Because of the fraudulent issuance of receipts in the past by warehouses which were not operated under the Federal law, arrangements were made during the past year for throwing greater safeguards about the issuance of warehouse receipts. The department has arranged with a company which manufactures safety paper to manufacture a special paper bearing a special design which will be issued only to those printers designated by the department for printing warehouse receipts. The designated printers have entered into a contract with the department which will result in giving the warehousemen receipts of superior quality at a lower cost, and which will make it almost impossible for anyone to issue fraudulent receipts. Under this plan the warehousemen place their orders for receipts through designated department representatives who maintain a register of all receipts ordered and who in turn place the orders with the designated printers. Before these receipts are sent to the warehousemen they are carefully checked by department representatives to see that the receipts coincide with the register. They are then sealed by department representatives. When inspections are made of warehouses it is incumbent upon the warehouseman to produce either the receipts which were sent him or, in their absence, to produce copies of the receipts showing that the originals were issued in due form and then produce the commodity in the warehouse which is supposed to be covered by the receipts, or the original receipt properly canceled. This gives the department a complete check on all receipts which the warehouseman is authorized to use. It is the biggest step which has been taken in warehousing to protect the interests of the warehouseman, the depositor, and the banker who may make loans on the warehouse receipt. The plan has been

accepted by all cotton warehousemen who are now licensed and will be put into operation in connection with the new products to which the act is extended during the coming year.

#### BRANCH OFFICES

During the past year the division maintained branch offices at Raleigh, N. C., Atlanta, Ga., Dallas, Tex., Kansas City, Mo., Portland, Oreg., and substations at New Orleans, La., Spokane and Walla Walla, Wash.

#### DIVISION OF COST OF MARKETING

A. V. SWARTHOUT, *In Charge*

This division is concerned chiefly with studies of the spread between the price which the producer of agricultural products receives and that which is paid by the consumer for these products. The total spread between producers' and consumers' prices is roughly known for a number of the more important agricultural products. The portion absorbed by each step in the marketing process is relatively little known, however, and much of the discussion which has been carried by the press has been founded on information not wholly accurate, because reliable and complete data have been available in but few cases. Effort is directed through this division and through the other divisions of the bureau to furnish information which will lead to the reduction of this spread.

The first move in the case of any particular product is to ascertain as accurately as possible what portion of the retail price accrues to each agency in the marketing chain, and, what is fully as important, to understand exactly what services are furnished in return for this portion. This has been done for several commodities, among them bread, milk, potatoes, and apples. In the study of these services and margins data have been uncovered which tend to explain some conditions which without explanation appear to be unjust. An illustration of this is the fact that flour as part of the cost of making bread is becoming less important and is being overshadowed by the cost of labor, of the operation of machinery, and, to some extent, of ingredients other than flour which the baker uses. Due largely to changes in the formula, the cost of these other ingredients has approximately doubled since 1913, while bakery labor has increased about 43

per cent during the same time; hence, since these other costs are relatively larger than the cost of flour in commercial bread making, changes in the price of bread could hardly be expected to follow closely the changes in the price of flour or wheat. The service cost of the preparation and distribution of food products has become such an important item that it far outweighs commodity values, and the consumer's price is influenced much more by fluctuations in these service costs than by fluctuation in farm value of the commodities.

Having ascertained the portion of the consumer's dollar which accrues to each of the agencies of production and distribution, the next step is to determine what the agency did with its portion, how much was paid for labor, rent, fuel, and other items which enter into the cost of doing business, and how much was left for profit to the owners of the business. Such studies as the department has made along this line point to the fact that the net profit received by owners of business is relatively small when considered as part of the total spread. It rarely runs over 5 per cent of the consumer's price and is generally much less than 5 per cent. The cost of furnishing this service, on the other hand, is a vitally more important part, comprising as it does approximately 95 per cent of the spread. Costs, therefore, are the important point of attack for any study looking toward a more efficient marketing system. These costs are greatly affected by efficiency of methods employed, by economic environment in which the particular business operated, size of business, and adequacy of the facilities.

### MARKETING OF KANSAS WHEAT

In cooperation with the Kansas Agricultural College a study was made covering the operations of 60 grain elevators in Kansas for the crop year 1921-22. These elevators are located in 10 counties, and their operations are believed to be typical of the methods used in marketing Kansas wheat. A preliminary report has been issued which shows the operating margin and the operating cost per bushel for each of the 60 elevators and the division of these costs between labor and other costs. It was found that the operating margin ranged from a loss of 2.05 cents to a gain of 9 cents per bushel, with an average of 4.1 cents. The operating costs varied from 1.9

to 7.42 cents, with an average of 4.37 cents. Net operating results on grain ranged from an operating loss of 8.47 cents to a profit of 6.67 cents per bushel, with the average showing a loss of 0.27 cent. These extremely wide variations in the costs and margins seem to indicate that there is a wide difference in the efficiency of methods used and in the effect of such other factors as competition, location, etc. This study has been continued and records secured during the current year from 194 elevators. A report is in preparation covering the two years' work.

### RETAIL MEAT TRADE

In cooperation with the Bureau of Business Research of the Northwestern University, a study has been made of the margins, expenses, and profits of retail meat stores in Chicago, Cleveland, and New York. A report has been issued covering the costs of the various sizes of stores and a discussion of the various cost factors. In addition to this, a series of five lectures has been issued, which should be very helpful to the retail meat trade, as they were given wide publicity. The titles of these lectures are as follows:

How Does Your Store Compare with Others?  
Population: Its Effect upon Your Profits.  
Save in Wages.  
That Question of Turnover.  
Compute Expenses as Percentages of Sales.

### RETAIL PRICE OF POTATOES

An analysis of the retail price of potatoes grown in Maine, Minnesota, Wisconsin, and Michigan and sold in Boston, Chicago, and Pittsburgh has also been completed. This study covers prices, costs and methods, and conditions under which these potatoes were marketed. In cooperation with Cornell University, studies were made of the costs of marketing potatoes in New York, with especial emphasis on the activities of the country buyer and local cooperative association.

### PRICE OF MILK IN WASHINGTON

A study has been completed covering an analysis of the retail price of milk sold in Washington, D. C. This study furnishes an analysis of the costs of milk delivered on routes by the distributor, milk sold through groceries and delicatessens, and milk sold through cash-and-carry chain stores.

**RETAIL PRICES OF BREAD**

A study has been completed covering an analysis of the retail price of bread in seven cities. This study brings out information covering each step in the marketing process and the services and margins involved. In all of these studies it is the aim to make public detailed information covering the varying conditions and methods in order that the way to further study and needed improvements can be more clearly discerned.

**RETAIL MARGIN STUDIES**

Studies of retail margins on certain selected fruits and vegetables have been carried on in New York City, Trenton, and Washington, D. C., during the past year, data in New York being collected in cooperation with the Port of New York Authority, and those in Trenton with the State department of markets. The studies in Trenton and Washington are being continued and the material already collected is being analyzed as the basis for a preliminary report.

A study of retail margins of citrus fruits in 39 cities for a period of 10 years was inaugurated during the year and will be finished during this year. The prices on which this study is based were collected by the California Fruit Exchange as part of its regular work and have been loaned to the bureau by that organization.

**TRUCKING COSTS IN NEW YORK CITY**

A study of costs of trucking fruits and vegetables in New York City was conducted and a manuscript for a report has been prepared and will be issued within a short time. The study was carried on in cooperation with the Port of New York Authority and has developed some exceedingly interesting facts as to the wastefulness and inadequacy of present trucking methods.

**ADMINISTRATION OF CENTER MARKET**

C. W. KITCHEN, *Superintendent*

Administration, C. H. WALLEIGH; Mechanical Section, S. R. MULLEN; Cold Storage, W. J. CAPNER; Inspection, L. A. DELLWIG and G. A. ANTHONY

Litigation between the United States and the Washington Market Co. was concluded during the year. Pursuant to the provision of the act of Congress approved March 4, 1921 (41 Stat. 1441), the appraisal commission

appointed by the President filed its award, after careful deliberation and consideration of voluminous testimony introduced by the experts employed by both sides. The amount fixed was \$960,250, which covered the purchase of the buildings and improvements made at the expense of the Washington Market Co. The value of the land was not included in the award, as title to the land had always vested in the Government. An appeal from the award was immediately noted by the company. This appeal was argued before the district court in December, 1923, and a decision rendered by the court on February 5, 1924, awarding the company a total of \$1,522,197.88, an increase of \$561,947.88 over the amount awarded by the appraisal commission. The act of March 4, 1921, provided that the decision of the district court of appeals should be final, consequently all proceedings covering the transfer of this property to the Government have been concluded.

**MARKET RESEARCH WORK**

The collection of wholesale and retail prices weekly for the Cost of Marketing Division was continued with intensive study of data secured from eight meat dealers and from a like number of dealers in other products. All stand holders were required to submit a financial report of business done during the calendar year ended December 31, 1923, part of which information was used by the Cost of Marketing Division for marginal studies being conducted by that division. Lack of adequate information with regard to costs is believed to contribute very largely to the hazards of retailing; and it is felt that the keeping of records will be helpful to the dealers, in addition to furnishing useful data to the department. There were also secured reports on retail prices prevailing at several other public markets in Washington for comparison with prices at Center Market.

The total volume of business reported by retail dealers for 1923 is \$9,451,921.81. In addition, business to the amount of approximately \$5,000,000 was done in the wholesale houses. No record was obtainable of the sales made by the 200 farmers using spaces on the south side of the building. The operation of Center Market furnishes the bureau an excellent opportunity to study at first hand the problems confronting retail dealers in agricultural food products.

## REPAIRS AND IMPROVEMENTS

The program of repairs and improvements started during the first year's operation was continued. Some of these changes have added to the value of the plant while others have reduced the annual operating expenses, and some have increased the earning capacity. The first improvement made during the year was the erection of an incinerator at a cost of \$4,500, which permits of immediate disposition of all debris which had previously been hauled away at a cost of approximately \$2,000 per annum. This equipment relieves congestion and has improved sanitary conditions materially. Two wooden coolers in the courtyard were replaced by others of brick construction which are more efficient and have resulted in the elimination of waste in refrigeration. Eight new modern stands and two cold-storage boxes were completed during the year, and concrete and iron stands were erected for the use of farmers occupying spaces on the street. The increased annual revenue which the above-mentioned improvements will produce is approximately \$2,100, and the saving in operation approximately \$2,000. The total cost of repairs during the year was \$22,250, which included many minor repairs in addition to those mentioned.

## SANITARY CONDITIONS IMPROVED

Persistent efforts were made to keep the market and cold storage clean and improvements in sanitation were effected. Rats and other vermin are being destroyed constantly, and for this work assistance was rendered by the Bureau of Biological Survey. This phase of sanitation work requires constant vigilance. The inspection of meat and meat products and equipment used in the sale of food products has proven useful and valuable, both as a protective measure and in maintaining the confidence of the public in the wholesomeness of food sold at Center Market.

## ICE AND REFRIGERATOR SERVICE

The revenue derived from the sale of ice was less than for the previous year due to the adjustment in price downward to meet competition, and to decreased tonnage sold. The revenue derived from public cold-storage space was practically the same as during the preceding year, but incomes from all space refrigerated was somewhat more. This was brought about by

partitioning certain rooms to accommodate more patrons on a rental basis at a gross increase of rental, also by increasing the space under refrigeration.

## MARKET SUPERVISION

The supervision of the market appears to have been satisfactory to all interests. There were no serious violations of the regulations and but few minor infractions during the year. The demand for space in the market continues and only eight stands changed tenants during the period—without loss of rental to the Government. This condition obtains both as to dealers within the market and to the farmers occupying spaces on the outside of the building. The dealers generally have shown a spirit of cooperation in keeping the market clean and attractive. The two inspectors are constantly on the alert for conditions that might be a menace to health. The inspectors also perform educational work in aiding the various space holders in improving the appearance and conduct of their stands.

## DIVISION OF AGRICULTURAL FINANCE

NILS A. OLSEN, *In Charge*

Farm Credit, G. F. CADISCH; Farm Taxation, C. O. BRANNEN, Farm Insurance.

As a result of the agricultural depression there has developed an active demand for specific information in regard to the financial difficulties and losses of farmers. In order to secure authentic information along these lines a number of studies have been made, some of the results of which have been given wide publicity. A survey was made of farm foreclosures in 15 States in the Middle West. This study brought out the fact that about 8½ per cent of farm owners in these States lost their farms, with or without legal proceedings, between the spring of 1920 and March of 1923. In addition another 15 per cent of the owners were in fact insolvent, but retained possession of their farms through the leniency of creditors. On the other hand, about 14½ per cent of the tenants were found to have lost their property and about 20½ per cent were reported to be on the verge of failure. A survey is being made at the present time in an effort to obtain more adequate data as to the present indebtedness of farmers, as well as the increase or decrease of such debt since 1920. Material also is

being compiled which will serve as indices of changes in the financial condition of farmers. This includes data on farmer bankruptcy cases reported to the Department of Justice, bank failures, commercial failures, and other information which will reflect agricultural conditions. This material shows, for example, that an average of 827 farmers yearly went through bankruptcy before the war as compared with an average of 4,578 during each of the last four years. The manner in which depression in agriculture reacts on business is well illustrated in the record of bank failures. During the four pre-war years, 1910-1913, a total of 200 banks failed, whereas the failures during the four years July 1, 1920, to June 30, 1924, numbered 1,960. Data of this kind are being compiled by years and by States to show time and regional changes in conditions.

#### FARMERS' CREDIT PROBLEMS

The increase in farm debt with its heavy carrying charges has emphasized the importance of using credit wisely and obtaining it at a minimum of cost. Several farm-credit studies have been in progress, the purpose of which is to obtain more detailed information in regard to the credit needs of farmers and the degree to which the various credit agencies serve the farmers adequately and economically.

A study was begun in March on general farm-credit conditions in the United States. The object of this project is to ascertain the volume, sources, costs, terms, and purposes of various classes of credit used by farmers in all parts of the United States. Detailed information has been obtained in regard to farm credit advanced by commercial banks with a view to determining the extent to which these institutions function satisfactorily in the interests of agriculture.

Requests from farmers for credit information, particularly in regard to intermediate credit, have been numerous, and every effort has been made to give these inquiries the attention they deserve. A leaflet on Intermediate Credit for the Farmer was prepared to show farmers how credit is obtained through the new system. The credit facilities provided by the Federal Government have been explained in several magazine articles and news releases.

Cooperative relations by this division with the Federal Farm Loan

Board have been maintained and strengthened. Credit problems which this bureau had occasion to refer to the board have been given careful consideration. On the other hand, this bureau has brought to the attention of the board the fact that the department has a fund of data which should prove extremely useful in the administration of the Federal farm loan and intermediate credit systems. In response to requests from the board some time has been spent in bringing together for them material on specific credit problems.

A number of local farm credit surveys have been made in cooperation with several States in the Cotton Belt. The first of these studies was made in North Carolina and the results published as a bulletin of the State Agricultural College of North Carolina. Other surveys which follow the general plan of the North Carolina study are under way in South Carolina, Georgia, and Tennessee. A study is being made in Texas which covers problems of land tenure, land utilization, rural credit, and farm insurance. Among other useful purposes these studies have served already to illustrate the extent to which farmers depend upon merchant credit in Southern States and the unsatisfactory character of this kind of short-term credit. It was found, for example, that the interest rate charged for merchant credit by various agencies in selected areas of North Carolina in 1921 ranged from 12.8 to 34.3 per cent. These investigations point to the conclusion that the farmer who needs credit should obtain it from specialized credit institutions and not from stores, dealers, or factories.

A study is in progress to ascertain the changes which have taken place over a long period of time in the amount, sources, and conditions of farm mortgage loans in Nebraska. A number of preliminary field surveys have been made of the credit conditions surrounding the production and marketing of fruits, vegetables, and livestock in various parts of the country, and material gathered in this connection is being used in commodity bulletins now in preparation.

#### FEDERAL SEED LOANS

Direct loans to farmers by the Federal Government without the intervention of a financing intermediary are now frequently advocated. Since the soundness of this method of advancing credit to farmers has been questioned, the department's experi-

ence with seed loans will afford valuable light on the subject. Special arrangements were made during the year whereby the seed-loan records now held at Grand Forks, N. Dak., were tabulated. This material will be used as the basis for a report on the experience of the Federal Government with direct loans to farmers.

### FARM TAXATION PROBLEMS

The studies of the division in the field of farm taxation are of relatively recent origin. In general, it is the object of these studies to ascertain the relative burden of taxation on farm real estate as compared with other classes of "taxables," to ascertain the reasons for the inequalities in the taxation of farm land as compared with other taxable property, to analyze the purposes for which taxes are levied and expended, and to determine the bases for tax adjustments according to equitable and established standards of taxation.

The relation of taxes on farm real estate to net cash rent in 1919 for selected farms in 26 States was studied during the year. It is shown that taxes bear down with unequal weight upon farm land in various parts of the country. The percentage of net rent absorbed by taxes on the farms studied ranged from 5.6 per cent in Southampton County, Va., to 65.6 per cent in Chester County, Pa.

A study of the relation between taxes and rent of 109 Indiana farms during the years 1919 to 1923 has also been made. The tax per acre on these farms was found to have advanced from 90 cents in 1919 to \$1.60 in 1922, and declined to \$1.41 in 1923, and the percentage of net rent paid in taxes rose from 12.4 in 1919 to 39.6 in 1923. For comparative purposes similar information has been secured for urban real estate and banking institutions. Only 16.9 per cent of rural taxes paid in Indiana during 1923, according to these investigations, went to the State government. The remainder was levied and spent locally, 45.4 per cent by townships and 37.7 per cent by counties. Of the average farm tax dollar 47.6 cents was levied for the support of education and 27.8 cents for highways. The remaining 24.6 cents was divided between general government costs, benevolence, and miscellaneous expenditures.

During the past year cooperative studies of farm taxation have been conducted in Nebraska, Kansas, Mis-

souri, and Texas. These studies will show for a series of years the amount of taxes paid by farmers, the relation of farm taxes to farm rents, and the distribution of the farmer's "tax dollar."

An article entitled "Principles governing the equitable distribution of highway taxes" has been submitted for publication in the National Tax Conference Bulletin.

### DIVISION OF AGRICULTURAL COOPERATION

CHRIS L. CHRISTENSEN, *in charge*

Economics of Cooperation, A. W. MCKAY; Statistics of Cooperation, R. H. ELSWORTH; Legal Phases of Cooperation; Accounts and Business Practices of Cooperative Associations.

The work of the Division of Agricultural Cooperation during the fiscal year has been chiefly concerned with two projects, namely, economics of cooperation and statistics and history of cooperation. Considerable attention has also been given to legal questions pertaining to cooperative enterprises.

### COMPLETION OF COOPERATIVE STUDIES

During the year a study of the California Fruit Growers' Exchange was completed and the results appeared in bulletin form. This study covered the organization of the exchange, the development of the cooperative marketing of citrus fruit since 1893, an analysis of the economic problems that have confronted the exchange in the course of its 30 years of operation, the methods pursued in meeting these problems, and the services which the exchange has rendered the industry.

A second bulletin which was issued shortly after the end of the fiscal year treats in considerable detail the operating methods and operating expenses of the local associations that make up the California Fruit Growers' Exchange. It points out a number of opportunities for savings in the handling and marketing of citrus fruit.

A study of Danish cooperation was completed during the year and the results will be available in bulletin form early in the present year. The economic conditions which led to the extensive organization for cooperative marketing in Denmark, the underlying conditions of rural life and education which have strengthened the cooperative movement, the extension of the movement and its influence on Danish agriculture are presented in detail.

### ORGANIZATION PROBLEMS

A study was begun during the year of the organization problems and marketing practices of the fruit and vegetable associations in the United States. This study covers a large number of fruit and vegetable co-operative marketing organizations, and statistical information covering 1,232 such organizations has been analyzed. The report made will point out the current practices of fruit and vegetable associations, with a discussion of the success which has attended the adoption of these practices and the various economic conditions that have affected them.

A study of the cooperative organizations which have gone out of business since 1913 has been continued and a report is being prepared for publication. The division has records of approximately 1,050 organizations that have ceased to function since 1913. Of the total number it was found that probably not more than 20 per cent can be classed as failures in the accepted definition of this term. Many of them have dissolved without loss to creditors and in many instances without loss to stockholders.

### STATISTICS AND HISTORY

The work of collecting and tabulating statistical information regarding cooperative associations in the United States was continued. A tabulation made near the end of the fiscal year showed that information regarding 10,160 cooperative business organizations was available. These associations are classified according to farm products handled, type of enterprise, and the State and town in which located.

Data relative to the number of members, amount of business handled, number of years active, kinds of articles purchased, form of organization, the payment of stock and patronage dividends, and to practices regarding the use of contracts have been collected and tabulated. Much of this information has been made available through the mimeographed circular, *Agricultural Cooperation*. The records of thousands of cooperative associations are becoming more nearly complete as new data are collected. This material is of great value as a source library regarding cooperation in the United States.

A complete statistical review of agricultural cooperation in the United States up to June, 1924, has been prepared as a bulletin of the department

and is now in press. This publication contains detailed figures concerning the status of the cooperative movement in 1913, 1915, 1919, 1921, and 1923. There are also included in the statistical material tables showing the growth of about 30 of the larger organizations.

### COOPERATIVE GRAIN ELEVATORS

During the year the division began a study, in cooperation with the North Dakota Agricultural College, of the organization and operation of cooperative grain elevators in North Dakota. This work includes a survey of some 200 farmers' elevators in the State, a portion of which are known to be operating successfully and a portion of which are in financial difficulties.

At the request of a number of growers a survey was made in cooperation with the North Carolina State bureau of markets and Agricultural College of the strawberry producing area of North Carolina. The survey covered methods of handling strawberries locally and the marketing methods of local and terminal markets, with reference to the possibility of organization for cooperative marketing. Definite recommendations will be made to the producers as a result of this study.

A detailed study of the membership problems of the large centralized cooperative associations marketing tobacco has been begun. This study deals with the fundamental problems arising in the relationship of the members to their associations. Present methods of maintaining contacts with members and keeping members informed regarding the activities of the association will be studied. It is hoped that this study will lead to a more complete understanding of these problems and that it will form a basis for a practical program that may be adopted by the cooperative organizations.

A study of the development and present status of the farmer-controlled creamery, based on reports from 1,273 associations and a similar study regarding producer-controlled grain-marketing organizations in the United States, based on data furnished by 3,029 associations, have been made and the results published in mimeographed form. During the year statistical information was made available to other Government agencies, to colleges giving courses in cooperation and marketing, to students preparing theses and books upon various phases of coopera-

tion, State extension officials, editors of farm journals, many special writers upon agricultural subjects, officers of cooperative associations, and others.

#### SERVICE AND EXTENSION ACTIVITIES

Agricultural Cooperation, a mimeographed circular containing current news and legal, economic, and statistical information regarding cooperation in the United States and foreign countries, has been issued regularly throughout the year and has reached a large number of farmers, bankers, economists, experiment-station directors, county agents, and others.

The bureau has maintained close contact with extension directors, State marketing specialists, and other State officials regarding cooperative marketing problems. A number of State extension officials now refer to the bureau many problems arising in connection with the development of cooperative marketing in the States. Contacts with cooperative organizations have also been extended. Due largely to the information furnished them through Agricultural Cooperation many cooperative marketing officials now plan to keep the bureau advised regarding their activities and to consult with its representatives regarding special problems.

The division has issued a number of mimeographed reports during the year dealing with special phases of the cooperative movement. These have included a report regarding cooperation during the present decade, a summary of cases and decisions on legal phases of cooperation, a report regarding the principles and practices of cooperative marketing; another dealing with the strength and weakness of cooperative commodity marketing; and a third with the development and growth of cooperative marketing in the United States. Work was completed during the year on "A selected and annotated reading list in agricultural cooperation." This is an exceptionally valuable bibliography for students of cooperative purchasing, marketing, and credit. A brief review of each work cited is given for the benefit of the reader.

#### DIVISION OF LAND ECONOMICS

L. C. GRAY, *in Charge.*

Land Resources and Utilization, O. E. BAKER; Land Reclamation, Sale, and Settlement, R. P. TELE; Land Tenure, C. L. STEWART; Land Values, C. R. CHAMBERS; Farm Labor, J. C. FOLSOM.

The work of this division deals with the utilization of the land resources of

the Nation for meeting its agricultural needs. It involves a cataloguing of all land resources, a determination of present and future needs for the products of the land, and the outlining of policies that will tend to bring about desirable adjustments in use. There is very little systematic information on the land resources available for use in agriculture or on the ways in which the land resources of the country are now being used. A great deal of hardship, both to established farmers and to pioneer farmers, has been due to ill-judged and misdirected expansion of agriculture. This division is studying the need for land as related to population increase and the regions in which the best opportunities for expansion exist; also the methods used in selling and promoting the settlement of land with a view to developing the most efficient and economic methods of agricultural expansion.

There is very inadequate information as to changes in farm-land values and the influence of the various factors that affect these values. Effort is being made to measure the forces that determine value as a basis for better methods of appraising land for sale, taxation, or credit. The work of the division is directed toward obtaining a more complete knowledge of how the farm land of the United States is owned and of the relationship of such ownership to the welfare of the farming industry and of persons engaged in agriculture, and toward the better understanding of the relationships of the owners of land to those engaged in farming; in short, the various problems of farm ownership and tenancy and the conditions of employment of hired farm laborers.

Finally, all these studies are directed toward an attempt to formulate and suggest legislative policies both for the Nation and the various States which will create a sound economic and social relationship of the farming industry toward the land.

#### FUTURE LAND REQUIREMENTS

The various problems of land utilization often involve the coordination of the work of several of the bureaus of the department, especially the Bureaus of Soils, Public Roads, Plant Industry, Animal Industry, and the Forest Service. This is effected through the committee on land utilization, of which the leader of the Division of Land Economics is chairman. The committee has made a report to the Secretary on the subject of the future land requirements of the

United States in relation to the available supply of land, which was published in brief form in the 1923 Yearbook. Plans are being made for a detailed study of the utilization of the land resources of cut-over sections in the South Atlantic and Gulf Coastal Plains.

#### LAND UTILIZATION DATA

Undoubtedly the most important accomplishment of the year was the work done by the division in connection with the 1923 Yearbook. Two of the articles, one on the utilization of our land for crops, pasture, and forest, and one on farm ownership and tenancy, and a large part of a third on our forage resources were prepared in this division. All the articles in the Yearbook were statistically checked in this division and more or less supplemented, and the entire Yearbook was prepared under the editorial supervision of one of the economists of this division. In addition to the Yearbook articles, 15 bulletins and a large number of mimeographed releases, press releases, and public addresses were prepared by members of the staff in an effort to make quickly available the results of the work of the division.

#### LAND SETTLEMENT AND RECLAMATION

An outstanding accomplishment of this year was the completion of an extensive survey of methods of land settlement in the Great Lakes States. This report analyzes in great detail the practices of the various types of land-settlement agencies operating in that region and the relationship of their practices to the progress and welfare of the settlers.

A study dealing in a broad way with the economic results of our reclamation policy has been completed. A detailed study in the form of a field survey was completed during the past summer in Texas and New Mexico, in cooperation with the Bureau of Public Roads. Several hundred reports were obtained from settlers on five different reclamation projects. A member of this division also acted as chairman of the departmental committee assigned to investigate and report upon the economic feasibility of a proposed irrigation project, at the request of the Secretary of the Interior. A comprehensive survey of the machinery and methods employed by the various States in the encouragement and regulation of land settlement was made and the results of this study are nearly ready for publication.

#### LAND RESOURCES

A study was made of the general land resources of the United States in their relation to the needs for land. This work was introductory to annual studies on the trend of land utilization and to more detailed regional studies. The first of these regional studies is devoted to the North and Central Great Plains and has been under way for several years. It involves cooperative work with the Department of the Interior and the cooperation of a number of other bureaus of the Department of Agriculture, but the work of coordinating and supervising the entire project is in charge of this division. This project includes the study of the agricultural geography of the region, the land tenure and the economic aspects of land utilization and settlement. In this connection, field surveys were carried on by this division during the past summer in eastern Colorado and western Kansas, in cooperation with the State experiment stations.

During the past two years the division has been cooperating with the Bureau of the Census in the tabulation of the six questions on uses of land in the 1920 census. This material has been of great value in connection with other studies of land utilization, and when taken in connection with the forthcoming data from the agricultural census of 1925, will afford a significant basis for determining the recent trend in land utilization.

#### LAND VALUATION

The studies of farm-land values determine by statistical methods the influence of various factors on land values. Significant relationships of income to values have been established. Another important phase of these studies has been a series of surveys in Indiana and Iowa, in cooperation with the Bureau of Public Roads and the Iowa Experiment Station, to determine the influence of various local factors on farm-land values, particularly type of road. Preliminary results indicate strongly that above a given point the value of farm real estate does not increase in proportion to the expenditure for improvement on roads adjacent to the property. If this conclusion is confirmed by further surveys it will introduce a basis for extensive readjustment of policies for financing road building. Special attention is being given to work on the relation of the trend of farm-land values to economic cycles and to studying the rela-

tion of income to capital value in the least developed cut-over portions of the timbered section of the country.

#### FARM OWNERSHIP AND TENANCY

The article on Farm Ownership and Tenancy, contributed to the 1923 Yearbook, is a brief summary of some of the results from the research work of this division covering several years, and a graphic presentation of some of the significant facts revealed by the census of 1920. A study has been made of the records of a large corporate estate, which shows the relationship of farm-land values to various other economic factors over a period of several decades. Among other things, the study showed that the influence of price of a product was greater than the influence of yield in determining the variations in rents and values of farm real estate. For the past two years a comprehensive questionnaire has been issued to crop correspondents to ascertain the trend with respect to farm ownership and tenancy and the changes of occupancy. An extensive study of various conditions, determining the financial and tenure progress of farmers, has been nearly completed. Another extensive study of the ownership of land, based on special tabulations from 200,000 census schedules and 25,000 replies to a questionnaire, has been made. A statistical correlation of form of tenure with size of farm, farm-land value, and color of the occupant, with a view to giving a more precise statement of conclusions, heretofore based largely on inference, has been nearly completed. A special study has been made also of part owners as a class of farm operators. A study has been carried on involving the correlation of the standards of living with various phases and conditions of economic progress of farmers. A study of the economic status of negro tenants and owner farmers has been carried on in Virginia and Kansas.

#### STUDIES OF FARM LABOR

The farm laborer occupies a definite position in the so-called tenure and financial ladder, and his position represents a stage in the economic progress of farmers. Special studies of the conditions of supply and demand of farm labor have been made during the past year. Two of these are based on surveys of conditions in the wheat belt, while two are studies of trucking areas in Massachusetts and New Jersey. A survey is being made also of

conditions and machinery of employment in all the North Atlantic States.

#### STATISTICS ON LAND ECONOMICS

For some time the need has been felt for more comprehensive annual statistics on various important aspects of land economics. In connection with the Division of Crop Estimates, arrangements have been made for the establishment of a list of 60,000 correspondents. The division will send inquiries to these correspondents four times each year, involving (1) land values and turnover; (2) land tenure and occupancy; (3) land utilization; and (4) farm-labor conditions. Arrangements are being made also for a special list of real estate men to serve as correspondents. In this project the division has the sympathetic support of the National Association of Real Estate Boards.

#### DIVISION OF STATISTICAL AND HISTORICAL RESEARCH

O. C. STINE, *In Charge*

Foreign Competition and Demand, L. G. MICHAEL; Marketing Statistics, LOUIS H. BEAN and LEWIS B. FLOHR; Production Statistics, PERRY ELLIOTT; Transportation, J. G. CROSS; Agricultural History, DONALD JACKSON; Graphics, G. C. HAAS; Consulting Statistician, G. B. L. ARNER

The principal activities of this division during the past year have been the collection and the dissemination of information relating to foreign competition and demand; the development of bases for determining trends of production, measuring demands for agricultural products, and forecasting prices; the accumulation of historical records; and the standardization of graphic and statistical work.

#### FOREIGN COMPETITION AND DEMAND

The collection and dissemination of information on foreign competition and demand has increased greatly during the past year and with the beginning of the current fiscal year a reorganization of the work is being made which will place an additional number of able economists and statisticians in the foreign field. Additional offices are being established in Europe to keep in closer touch with developments both favorable and unfavorable from the standpoint of American agriculture and to furnish analyses and interpretations of the European situation with regard to production of and demand for agricultural products.

Contacts will be maintained also with agencies purchasing American farm products and educational work will be done in acquainting European buyers with American standards for farm products and in acquainting American producers in turn with the needs of the European trade.

#### FOREIGN OFFICES MAINTAINED

The London office has kept the department in close touch with conditions of the market for agricultural products in the British Isles and has served also as a contact point for collecting information relative to fruit production in the Mediterranean Basin. Arrangements have been made for reports at regular intervals on almonds, citrus fruits, and prunes from the important producing areas.

On account of unsettled and rapidly changing conditions in Germany the Berlin office has been a very important post during the past year. Through this office the department has been kept informed about production and markets for agricultural products in Germany and conditions affecting the markets. Efforts have been made to establish direct contacts between American producers and German buyers and to stimulate demands for our agricultural products. Films showing the production and inspection of meats in the United States have been shown in many moving-picture theaters in Germany. German importers have been supplied lists of American exporters of pork, pork products, grain, and flour. A weekly report has been made upon conditions and tendencies of the Hamburg grain market. In an effort to expand our market for wheat and flour in Germany bankers and importers were interviewed and steps were taken in working out plans for financing imports.

The collection and dissemination of information has increased greatly during the year. The use of radio and cable by the International Institute of Agriculture has increased the value of the information received from that source. The International Institute receives reports by cable from 26 countries, and these reports are promptly cabled to the United States. Through this service important reports are received in the United States soon after they are given to the public in the country to which they relate and are made available promptly to the producers in the United States.

The representatives of the bureau in foreign countries keep the department fully informed of crop and market conditions in the countries to which they are assigned and provide accurate and detailed reports on important developments affecting markets and the supply of agricultural products to be sold in competition with products from the United States. This work is being carried on from London, Berlin, Rome, Budapest, and Buenos Aires.

The cooperation of the State Department in placing the consular officers at the service of the Department of Agriculture makes possible the collection of much detailed information. There are 350 consular offices scattered throughout the world and questionnaires have been prepared and submitted to the consuls in countries or at points from which information is desired on wool, broom-corn, onions, rye, dairy products, cotton, wheat, hemp, and peanuts. In cases of emergency reports are secured by cable or radio. A large number of special reports written by the consuls are sent through the State Department to the Department of Agriculture, and these reports contain much valuable information on crop and market conditions in all parts of the world.

The information collected from the International Institute, consular offices, and the representatives of the department is all collated, organized, and used in furnishing timely crop and market information, and also for analytical studies of the foreign agricultural situation and trends of production and consumption. The number of reports handled has increased during the past year from approximately 10,000 to 13,000, while the circulation of each report has almost doubled.

#### FOREIGN PRODUCTION RECORDS

Records have been kept of the production in foreign countries of all major crops and classes of livestock. Promptly as current reports are received, especially by cable or radio, statements are prepared for the press and telegraphed to interested persons. Each current report is carefully studied and compared with previous reports for interpretation and a statement is prepared indicating its significance in relation to the market for our agricultural products. Records are being built up which provide the basis

for interpreting current information. War changes in boundaries make it necessary to study carefully the statistics of many European countries for the purpose of making comparison between pre-war and post-war production. The task of working out these comparisons is almost completed.

#### AGRICULTURAL TRADE STATISTICS

Statistics of international trade in agricultural products are collected, tabulated, and analyzed. Many statistical tables are prepared for publication in department publications and in the Yearbook. An index number showing the movement in the volume of agricultural products has been prepared.

An analysis has been made of the factors affecting demand for American pork products. A large amount of statistical material has been collected on prices and production of hogs in foreign countries and plans have been made for regular reports of the most important facts and the prompt dissemination of the information in this country. Much material also has been collected relative to the international trade in dairy products, and arrangements have been made for securing regular reports on the prices and the supply of dairy products in some of the principal European markets.

Information as to ocean-freight rates, tariffs, and other restrictions upon the imports of agricultural products by foreign countries is being collected and studied in relation to the market for agricultural products. Special attention has been given to conditions affecting the demand for agricultural products in foreign markets. Data as to employment and wages are being collected because of the relation of consumers' buying power to demand. Special studies have been made of Germany and the United Kingdom as a market for agricultural products.

#### WORLD SURVEY OF AGRICULTURE

The surveys of the agriculture of France, Denmark, Germany, and Poland begun last year have been completed and reports of these surveys are being prepared for publication. A survey was made also of the almond production in the Mediterranean Basin, covering the costs and methods of producing almonds, as well as methods of marketing and prices obtained by the producers. Reports on the agriculture of Chile, Peru, and Argentina have been completed and material is being

prepared for publication as a basis for interpreting foreign information in the countries surveyed. A survey has been made also of the agriculture of Spain and the report is practically ready for publication.

#### GRAPHIC PRESENTATION

Owing to an urgent demand from the various divisions of this bureau, from other Government departments, and elsewhere, a publication is being prepared covering the principles and methods of good graphic presentation. The aim is to secure the use of standard forms of graphic presentation. It is hoped that what has been accomplished in the way of standardization and use of better methods will add greatly to the usefulness of the future publications of the bureau. The progress in the standardization of graphic presentation may be noted in the statistical tables of the department Yearbook.

#### FORECASTING PRICES

A study of unusual interest is the development of bases for forecasting prices through statistical analyses. A special study of the price of oats has been made during the year for the purpose of working out a basis for forecasting oat prices. In this study statistical methods were used to determine the factors affecting the price of oats and in so far as possible to measure the strength of the various factors. This study has made a substantial contribution to this end, but much remains to be done. A large amount of experimental work has been done in measuring the factors affecting prices of corn and hogs. Methods have been developed by which fairly accurate forecasts of the prices of hogs can be made several months in advance. Work will be continued in an effort to develop entirely satisfactory bases for forecasting prices.

#### DIVISION OF FARM POPULATION AND RURAL LIFE

C. J. GALPIN, *in Charge*

Rural Population Statistics, V. B. LARSON; Popular Aspects of Rural Community Buildings, W. C. NASON; Farmers' Standard of Living, E. L. KIRKPATRICK.

Largely through the efforts of this department, "farm population," a definite term which includes those persons who are actually living on farms, is being substituted for the old loose term of "rural population," which included many persons living in small villages and suburbs of cities. The

Bureau of the Census has included six questions pertaining to farms in the 1925 agricultural census schedules which will yield very definite statistics with regard to actual farm population. It has been recognized by leading economists, as well as by the press and various agencies, that authentic statistics on farm population and movements and trends of farm population are necessary to an understanding of general economic conditions.

#### CHANGES IN FARM POPULATION

The currents of movement to and from farms are beginning to receive the attention which this highly important subject merits. Leading economists have begun to look upon this movement as an excellent index of the state of the economic health of agriculture. While farm owners are often slow to shift their occupation on account of economic pressure, the farm laborer class responds quickly, and when methods have been worked out whereby accurate current statistics can be secured with regard to the movement to and from the farm an index will be secured which will respond promptly to changes in condition of prosperity in agriculture. This division is perfecting its methods of studying these movements and it may be possible in the near future to give out annual or semiannual figures on the movements to and from the farm.

#### FARMERS' STANDARD OF LIVING

The first study on the farmer's standard of living, put out in January, 1924, met with instant appreciation. The number of research projects in a wide spread of States, the inquiries from the press, as well as discussions in various conferences, all testify to the basic character of this study. It is particularly interesting to note that discussions have arisen on "How the farm community can raise its general standard of living without more money to spend"; and on a still more interesting topic, "How far is raising the farmer's standard of living a solution to the farmer's economic problem"? The economic significance of the standard of living studies apparently is just reaching the point where a statement of principles can be made. It is believed that a thorough understanding of the problems involved is fundamental to the relief of distress among the rural population, whether this relief is to come through indi-

vidual effort, through farmers' organizations, or through legislation.

#### RELIEF OF TAXATION

Closely connected with standard of living studies is the question of farm taxation. Measures must be taken to relieve the farmers from the severe burden of taxation, and it is believed that much of this burden could be lifted by wiser and more effective expenditure of funds in the immediate locality. A general movement for a consolidation of schools and rural churches is already under way in many localities, as well as the formation of cooperative enterprises for many types which provide services for a community at less cost than they could be obtained by individual effort.

It has been pointed out that the farm population rears and educates a much greater number of children than a corresponding city population, and that there is a constant movement of young people toward the city. This is a subject which might well receive attention in formulating taxation policies. This field of research is very new and the problems involved are great, consequently the major part of the attention of this division is given to procuring reliable statistical data and to assisting the various State and other agencies in planning effective programs covering local country life problems.

#### INTEREST IN COLLEGE RESEARCH

There has been a marked increase during the year in the number of colleges of agriculture and other higher institutions asking for cooperative research problems with this bureau. Ten States began such studies during the year, none of which had done work of this type before. The directors of experiment stations have placed the human rural studies on their lists of legitimate projects. Without question, this admission of rural social studies into the ranks of science has been largely due to the establishment of a basic concept, "farm population," which permits of investigation on a scientific basis.

#### ECONOMIC LIBRARY

MARY G. LACY, *Librarian*

The work of the library has grown steadily in usefulness. The task of combining the libraries of the three bureaus which were consolidated to

form the Bureau of Agricultural Economics has been completed, and the large volume of routine work has been placed on an efficient basis. In addition to handling the requests for books, numbering approximately 16,000 during the past year, 1,874 periodicals are received regularly and circulated throughout the bureau. In addition to the marked increase in the use of the library by the members of the bureau, there has been noted a decided increase in its use by other bureaus and officers of the Government and by outside agencies.

The demand upon this library for bibliographical and reference work is particularly heavy, as it is invaluable to the research work of the bureau to have ready access to the literature of whatever field may be under investigation. In addition to preparing digests and annotated reading lists for the workers of the bureau, many requests for information are received from the public which are cared for by the staff of the library. The most important single bibliography compiled and issued during the year is entitled "Marketing of agricultural products" and consists of 133 mimeographed pages of annotated references. This bibliography was designed to include references to methods of marketing and discussions of the principles upon which methods of marketing should be based.

### DIVISION OF INFORMATION

J. CLYDE MARQUIS, *in Charge*

Editorial Economist-Statistician, S. W. MENDUM; Editorial, Miss C. B. SHERMAN, Miss A. P. RHODES; Periodicals, A. B. GENUNG, Miss C. M. VIEHMANN, Miss H. L. BONEBRAKE; Press Service, F. GEORGE, Jr.; Radio Market News Service, J. C. GILBERT; Exhibits, B. L. PERKINS; Research in Consumer Demand, L. A. ADAMS.

The product of the bureau's activities in the form of information for distribution in publications, through the press, by radio, and through direct contact with organizations and individuals has steadily increased during the year. While this increased output has been handled without expansion of the staff of the division, the character of the material has been steadily improved.

### PRESS INFORMATION

The widest and most timely distribution of results attained by the bureau is secured through the daily and weekly newspapers and the trade and farm press. To this end approxi-

mately 400 news stories and items of an economic nature, ranging from 600 to 2,000 words each, have been distributed this year. Circulation of the published items reaches into the millions.

Special articles designed for special localities or branches of farm industry have been prepared and distributed and 107 special articles on various phases of the bureau's work have been placed in a large number of widely varying business, professional, banking, and general magazines not agricultural in character, with a view to extending general knowledge of agricultural problems. Requests for such special articles are being received in increasing numbers.

The daily Marketgram has been distributed throughout the year from seven offices on the leased-wire system: Washington, New York, Cincinnati, Chicago, Kansas City, Minneapolis, and Atlanta. Omaha was discontinued during the year and Atlanta was taken on. The Marketgram is prepared in Washington on Mondays, Wednesdays, Thursdays, Fridays, and Saturdays of each week. Each issue covers the week ending on date of issue. This Marketgram is mimeographed in the several offices and mailed at once to daily and weekly newspapers. Through cooperation with the agencies that distribute plate services to newspapers, this weekly summarized market review now reaches over 2,000 weekly newspapers with an aggregate circulation of several millions of readers. A short daily review of market quotations, abstracted from the Marketgram, is supplied to the Daily Digest.

A special report known as the Boston Review is issued from the Boston office for the New England States. This report is prepared on Tuesdays and Fridays and gives a weekly review of the Boston market for fruits and vegetables, dairy products, dressed meats, and the Brighton livestock market. This review is mimeographed and mailed to 102 newspapers.

Weekly review of the grain market is prepared for certain journals with special reference to the localities they cover. This service is described in detail in the report of the Hay, Feed, and Seed Division where the review is prepared.

### RADIO NEWS SERVICE

Radio broadcasting has become an established form of distribution for market reports and agricultural news

after several years of careful experiment.

A survey of the use of radio by farmers' questionnaires was made through county agents, in cooperation with the Extension Service. The use of radio by farmers has been greatly extended during the year. The estimated number of radio receiving sets in use by farmers is over 370,000, compared to 145,000 a year ago.

Broadcasting by radio telegraph from the Navy stations at Washington, Great Lakes, New Orleans, and San Francisco was continued throughout the year, largely to facilitate the operation of field and market stations of the bureau not located on the leased-wire system.

Arrangements for broadcasting from a number of new privately owned radiophone stations have been made, especially in those sections covered by the extension of the leased-wire system. The need for trained market news announcers has been emphasized by the experience of the year. It has also been found that in the majority of instances the most desirable broadcast consists of a brief review of the day's market conditions given at the end of the day when farmers are at their homes. The development of programs from the various stations to meet this demand is being pushed. Special reviews are being prepared in many of the branch offices. Series of general radio talks have been given, and this form of broadcasting will be extended.

#### PROGRESS OF PUBLICATION WORK

The regular publication work of the bureau has progressed along established lines. Six contributions to the new series of statistical bulletins, begun by this bureau last year, have been submitted and three have been issued. Continued effort has been directed toward standardization of practices in statistical and graphic methods. Forty-five regular publications were edited and issued during the year, 30 were edited but are still in press, and 9 were edited but had not been transmitted for publication when the fiscal year closed.

Large distribution items include Crops and Markets, 4,193,000 copies; preliminary reports, 3,550 copies; speeches by chief of bureau and others, 3,350 copies; miscellaneous reports, 4,150.

Twice during the year a list of bureau publications and a list of periodical reports issued by the bureau are compiled. The old lists of publica-

tions of Office of Farm Management and Crop Estimates were revised and issued showing bulletins now exhausted, out of print, or reprinted since the last list was made. Total distribution: List of publications, 2,700; list of periodical reports, 850.

To get results of certain studies and investigations into the hands of those whom they are to benefit as soon as possible and to maintain interest of collaborators in the work, the bureau has developed and followed a plan of issuing preliminary reports in mimeograph form for limited distribution. These preliminary reports have been well received with special indorsement of the promptness with which they make results available. During the fiscal year, 41 such preliminary reports were issued.

Miscellaneous mimeograph work has been systematized during the year, and a considerable saving effected in paper and other costs. Over 4,000 orders were handled during the year. An index is now available, listing preliminary reports, grade specifications, deal reports, investigations, or anything of such nature for which there is likely to be a call. Special distribution of these reports is made as soon as issued.

A new outlet for certain kinds of material from this bureau has been arranged for through the Journal of Agricultural Research. It has been determined to segregate hereafter for publication in that journal analyses and descriptions of research methods and similar lines of work that are of much use to students but not to the great body of readers of agricultural bulletins.

Special publicity campaigns were put on, such as the "Clean your own wheat" campaign in the spring-wheat States. Other campaigns dealt with the standardization of farm products, uses of the market news services of the bureau, better methods of farm management, keeping of farm accounts, and other phases of agricultural economics. The press material issued in these campaigns was widely published.

#### CROPS AND MARKETS

In October plans were started for changing the scheme of publication of the weekly periodical, Weather, Crops, and Markets, to effect savings in the printing bills. These were worked out and put into effect with the beginning of the calendar year, when the name of the periodical was changed to Crops and Markets. The weather

reviews and charts were eliminated and have since been published by the Weather Bureau, and the material was divided into weekly reports of market movements and prices, 16 pages each week; monthly statistics and general reviews with the needs of the crop reporters and of statisticians chiefly in mind, one issue a month, 24 to 40 pages. The mailing lists were divided, about 15,000 to receive the weekly periodical, and 117,500 to receive the monthly supplements. The chief drawback now is the time required to issue the supplements which contain the crop reports.

#### EXTENDING ECONOMIC INFORMATION

Dissemination of economic material in cooperation with extension forces has gone forward according to the program laid down last year. In general, the effort has been to coordinate the bureau's material respecting production, movement, prices, and consumption, and to make it quickly available to key men throughout the country. Charts, brief special reports, and exchange reports from the colleges have been issued from time to time.

The Agricultural Situation, a 20-page multigraphed summary, has been issued promptly on the first day of each month. The circulation of this sheet, which expands only in response to specific, individual requests, has now reached approximately 4,500. Press clippings indicate that it is being increasingly quoted by farm papers.

A condensed 4-page edition of the Agricultural Situation has also been issued during the year over the signature of the Secretary, going to about 9,000 leading farmers who signified a desire to receive it. This edition gains special interest by reason of the fact that the Secretary personally writes and signs the first-page statement each month.

Issuance of regular mimeographed reports has continued. The Bureau of Agricultural Economics News has become an important asset to our branch offices, particularly, as it keeps them in touch with every development and change in the work of the bureau, its administration, its field activities, and its personnel.

The weekly report, State and Federal Marketing Activities, has been indexed since January, and the index is issued quarterly to increase the value of the report to marketing officials, teachers of marketing, and others in-

terested in the development of marketing work. A summary of extension work in marketing as conducted at 17 of the agricultural colleges during the calendar year 1923 has been compiled.

#### EXHIBITS, MOTION PICTURES, AND PHOTOGRAPHY

Demand for exhibits and other illustrative material depicting the work of the bureau continues. The bureau participated in three international exhibits during the year—International Textile Show, Boston, Mass., International Livestock Exposition, Chicago, and the International Dairy Congress exhibit at Syracuse, N. Y. Exhibits were made at many smaller shows and State fairs, including the Washington Radio Exposition. In the latter case the exhibit was afterwards loaned to the management of that exposition for use in other cities. A special cotton exhibit, accompanied by a cotton specialist as lecturer, was incorporated in the train exhibit sent through Texas by the Southern Pacific Railroad.

Three motion pictures were completed by the Office of Motion Pictures and released for use. The titles are "Citrus fruit in Florida," "Rice from paddy to bowl," and "Wheat or weeds."

A set of 17 pictures showing the process of cotton manufacture, miniature copies of one of the exhibits at the International Textile Show, has been developed and a number of these sets have been furnished to schools.

Seven portfolios illustrating the bureau's work in cotton investigations and standardization were prepared for the foreign delegates to the conferences relating to universal standards for American cotton and for the Liverpool Cotton Exchange; for use at the British Fair at Wembley, a portfolio was made relating to the cotton-boll weevil.

Processes of color photography have been studied and indications point to a successful method for our work, which is being watched by the bureau photographer. A large vacuum printing frame which permits prints to be made from original drawings up to 30 by 40 inches has been added to the laboratory equipment, which contains several unique devices. This will be used in making enlarged charts for use in exhibits and extension work.

Work in the photographic laboratory, especially that relating to the cotton standards, has increased to such an extent that another photographer has been added to the staff.

Many writers, publishers, and educators have been furnished with prints of photographs in the bureau collection.

The hand color work has been of great service, and a large number of bromide pictures and many models of potatoes and apples have been colored for exhibition and have received much commendation. Smaller photographs have been accurately colored for use by food-products inspectors in their work.

As partially indicative of the volume of regular work performed by the photographic laboratory the following approximated figures are of interest: Negatives made, 300; prints made, 3,353; sheets of letter-size photostat paper used, 45,600.

#### RESEARCH IN CONSUMER DEMAND

The investigations of factors affecting consumer demand of farm products begun last year have been continued and expanded. This work is conducted through questionnaire surveys gathered by trained field workers by house-to-house canvass. The object of these surveys is to learn direct from consumers the relative importance of various factors which determine the rate of consumption of a given food

product. The facts secured by the questionnaire method are checked against the statistics of the distribution of the products in the given locality in order to determine the importance of various influences. Studies of this character have been made on milk in Boston, Philadelphia, and Minneapolis; on raisins in Boston, Washington, Louisville, Denver, Minneapolis, Des Moines, and Cleveland; on citrus fruits in Boston and Washington, on cranberries in Washington, and on meats at Boston and Chicago.

This work is closely correlated with studies by marketing divisions of the distribution of farm products. The results already secured show that the method followed is reliable and relatively inexpensive. The influence of various forms of publicity and advertising upon the consumption of farm products have been given particular attention. The results of these surveys have been distributed among farmer's organizations interested in the sale of each product and have been found useful in planning publicity campaigns and in estimating the value of various types and forms of advertising. Preliminary reports containing the results of surveys on milk, raisins, cranberries, and citrus fruits have been prepared during the year.

